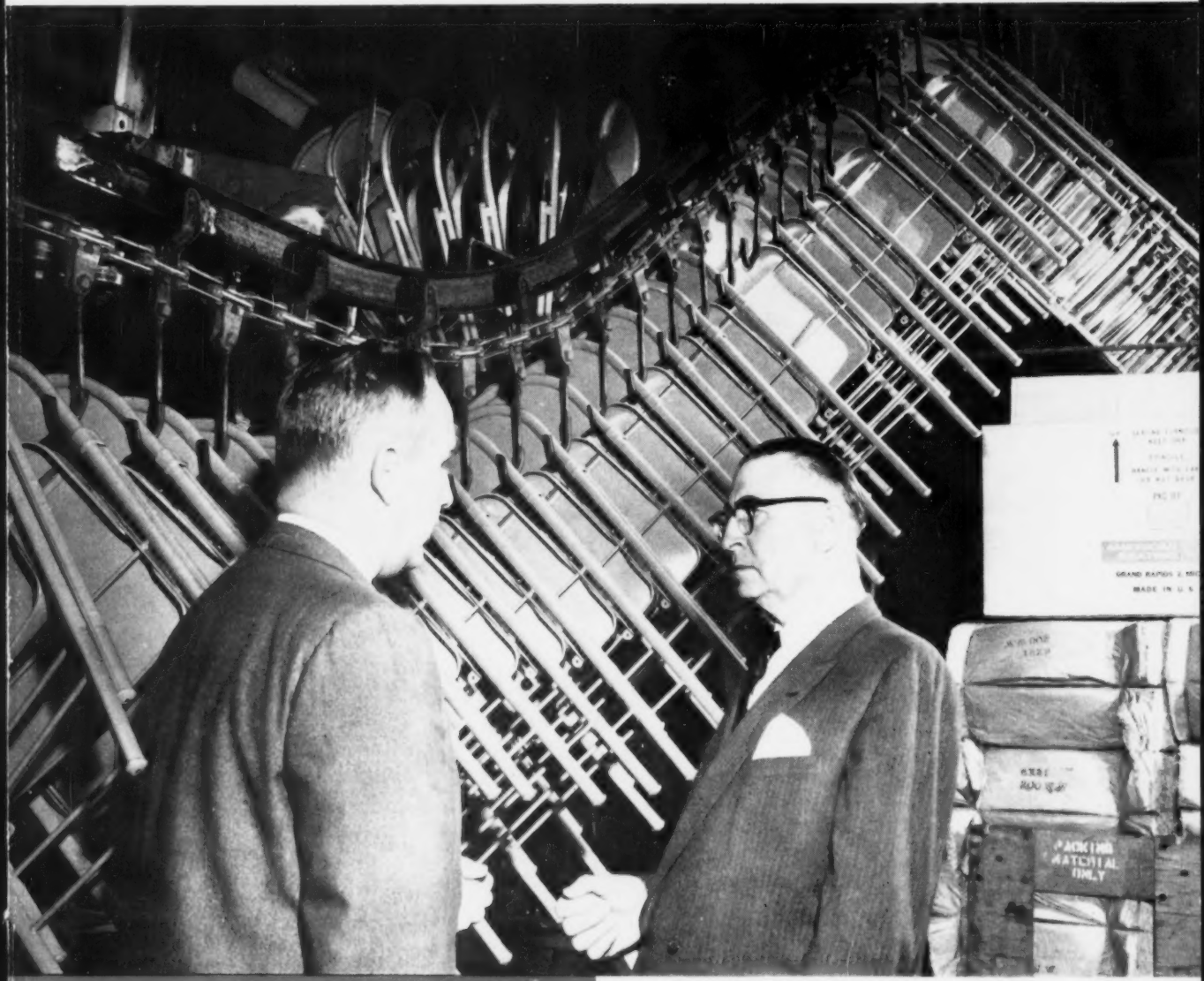
The IRON AGE
December 19, 1957 A Chilton Publication The National Metalworking Weekly



Good Handling: Money Alone Won't Do It P. 133

Is Linepipe Market Springing Some Leaks? – P. 93

Metals And Plastics Battle For Toy Dollar – P. 98

Digest of the Week P. 2-3

THE OTHER TURN

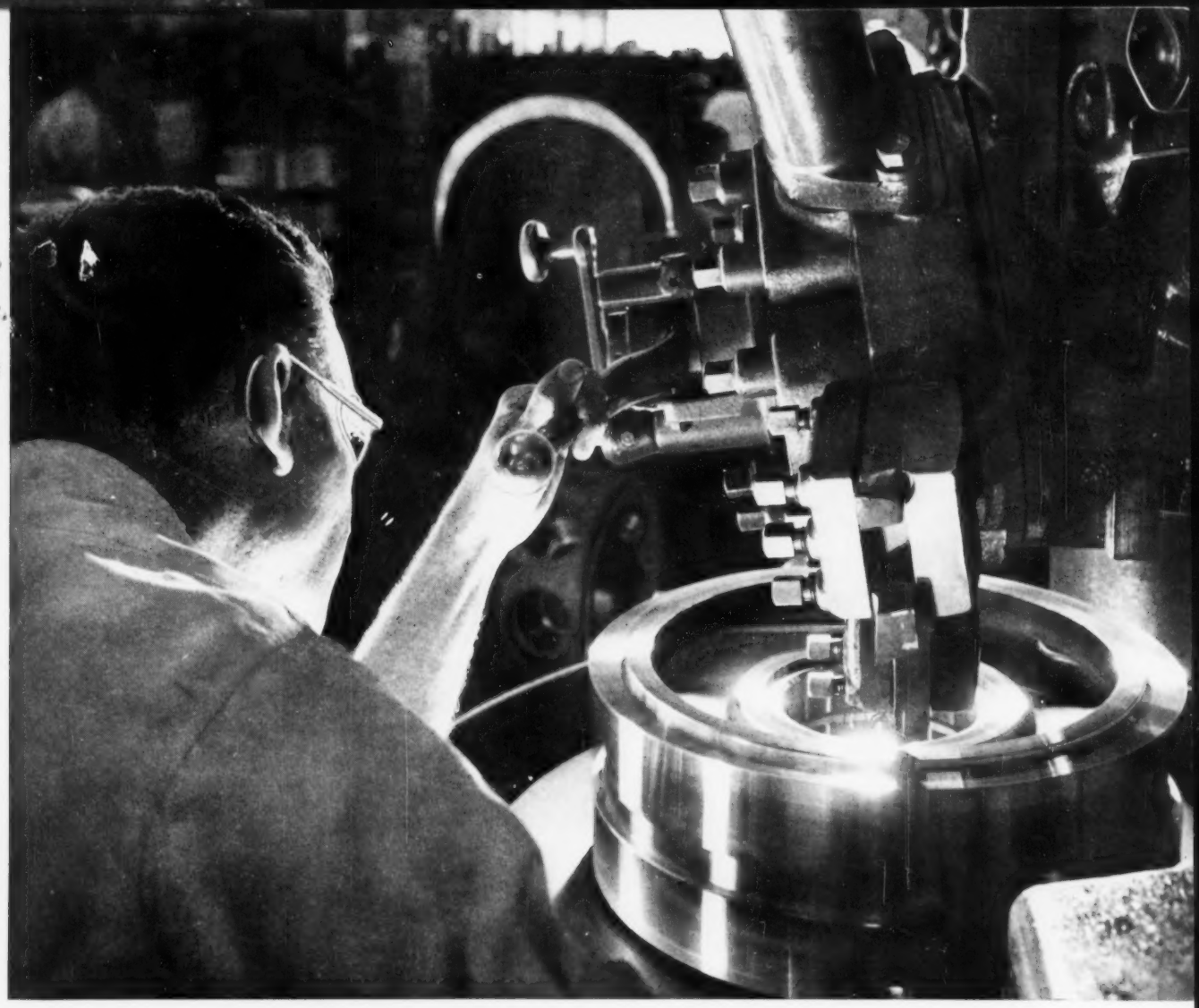
THEY GOT SO MANY GADGETS ON THE BOARD ALL JOE DOES IS JUST SIT AND PLAY HIS GEETAR.
GOOD HE CAN PLAY THAT THING --- SURE CAN'T RUN A FURNACE.
WHEN WE GET "PIPED-IN" MUSIC THEY WON'T EVEN NEED HIM.
THANKS TO— AN ANONYMOUS CONTRIBUTOR
HIEKE

The Hecklers

WHY NOT DESCRIBE YOUR OPEN-HEARTH CARTOON IDEA AND SEND IT ALONG TO US?

The benefits steelmakers obtain from our refractories are in part a result of Basic's on-the-job servicing. One of the rewards of this close relationship has been the opportunity to observe and appreciate the lighter side of these usually serious craftsmen.

BASIC INCORPORATED 845 HANNA BUILDING • CLEVELAND 15, OHIO



From a Sound Blank Comes a Sound Finished Product

One of the best ways to insure top quality in finished circular products is to insist on sound, reliable blanks. You have this assurance when your specifications call for Bethlehem blanks, which are unsurpassed anywhere.

These sturdy steel pieces are made in a two-way mill that combines the steps of forging and rolling. Blanks produced in this mill have uniformity and good grain flow. They are very strong; hence thinner sections can often be used. And their internal structure is so dependable that machining can be done with confidence. There is no hidden trouble lurking beneath the surface of the metal.

Bethlehem forged-and-rolled blanks are widely used in the making of gears, crane and industrial wheels, sheave wheels, flywheels, brake drums, turbine rotors, pipe flanges, and other circular products. They are available in a wide range of sections, and in sizes from 10 to 46 in. OD. Orders can be furnished heat-treated or untreated.

We suggest you get full details from the nearest Bethlehem office. Or write for a copy of Booklet 216, which contains many interesting facts and more than 80 photographs.

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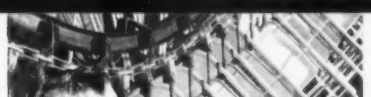
BETHLEHEM STEEL

BETHLEHEM STEEL



THE IRON AGE
Chestnut and 56th Sts.
Philadelphia 39, Pa.
SHerwood 8-2000

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Indexed in the Industrial Arts Index and the Engineering Index.

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The Entered as second class matter Nov. 8, 1952, at the Post Office at Philadelphia, under the Act of March 3, 1879. Price to the metal working industries only, or to people actively engaged therein, $5 for 1 year, $8 for 2 years in the United States, its territories and Canada. All others $15 for 1 year; other Western Hemisphere countries $25; other Foreign countries $25 per year. Single Copies 50¢. Annual Review Issue $2.00. Cable: Ironage, N. Y.

The IRON AGE

December 19, 1957—Vol. 180, No. 25

Digest of the Week in

*Starred items are digested at right.

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LINEPIPE

Springing Leaks — Business is still good with some bookings three years ahead. But a number of

bottlenecks have cropped up making the market spotty. One producer is off allocations. Others say some rolling time will be open in the first quarter. P. 93

FLORIDA INDUSTRY

Lured By Labor and Space — Many firms in the light industrial field are finding the business climate in Florida to their liking. Shipping disadvantages there are outweighed by other factors. P. 96

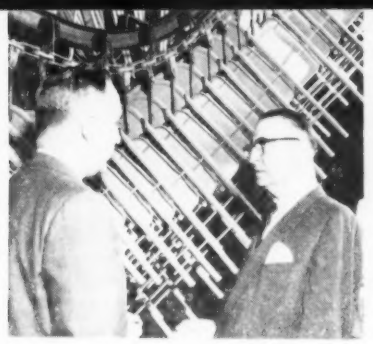
DEFENSE INFLATION?

Arms Spending Will Grow—In appraising the economic outlook don't overlook the effect of defense spending. It will provide a significant spark to the economy. P. 100

AUTO INDUSTRY

It's Big and Complex — U. S. consumers want cars. This, of

Metalworking



MODERNIZING A PLANT: Discussing a continuing program of plant improvement are American Seating Co.'s H. L. Bouwkamp, manufacturing engineer (left) and W. F. Jacobitz, plant manager. They've found it possible to modernize without adding expensive floor space. P. 133

course, is the basic reason why automaking is the nation's No. 1 industry. Its influence reaches into many segments of the economy. P. 110

MACHINE CONTROLS

Numerical or Tracer? — Which system is best for operating machine tools depends on conditions. But the well-equipped shop of tomorrow will probably use both. P. 119

FEATURE ARTICLES

ELECTRICAL FAILURES

Prevention Pays Its Way—It's a matter of knowing and applying the basic rules. With electric motors, four factors cause 90 pct of all trouble: Dirt, friction, moisture, and vibration. It takes a planned program to keep these in check. P. 137

FORM SHEET METAL

Press and Weld Steps—Production methods for common appliances are often taken for granted. But it's the choice of the right equipment that gets the high output. Washer tubs, starting as 36-in. diam blanks go through drawing, forming, trimming. P. 140

AVOID EMBRITTLEMENT

By Vacuum Deposition — There's one way to bypass problem of hydrogen-embrittlement in cadmium plated steel parts: Apply the cadmium in a vacuum chamber. Using standard equipment, cadmium coatings applied in this way meet all military specifications for key properties. P. 142

CLEAN PLANT WATER

At Low Cost — Modern clarifying equipment and an ion exchange system replace an old water-softening plant. The new unit gets better quality water and more of it, from an installation occupying less than half the area. P. 146

SELF-DUMPING HOPPERS

Speed Scrap Handling—A fork-truck driver picks up a load of scrap, weighs it, and returns the empty hopper in 3 to 5 minutes. It's done with a self-dumping hopper that makes scrap handling a part time job instead of the full time job by former methods. P. 148

MARKETS & PRICES

METAL TOYS

Compete With Plastics—Of the 350 million toys sold this year, more than 105 million were made of metal and 68 million of plastic. Lower-priced toys especially are being made of plastic. P. 98

ESTABLISHING PRICES

Keep Market in Mind — When you set the price of a new product give some thought to the market it will face. If product has new features it may "skim" the market at a good price. P. 99

CANADIAN EXPANSION

Seeks European Funds—Canadian businessmen are urging factories in Europe to set up Canadian branches. Combined with the dominion's own growing metalworking activity it adds up to more competition for U. S. P. 117

STEEL'S DILEMMA

Ingot Rate Versus Index—Many steel people feel the ingot rate gives a misleading impression of how their business is faring. Moves are underway to emphasize the more stable Index of Steel Production. P. 175

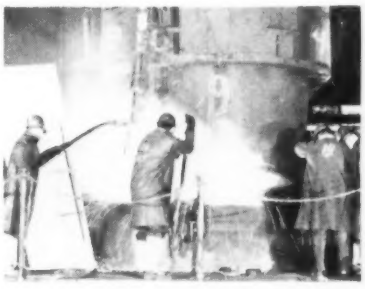
REFRACTORIES

Market Is Soft—The lag in steel operations has taken some of the starch out of refractory makers' sails. Consumers can now get immediate delivery on standard brick; two weeks on special items. P. 176

NEXT WEEK

REDS ON STEEL

Russia Moves Up — Russia is doing a lot better in the world steel race than the figures show. You have to probe deep to learn just how well they are doing. An appraisal from experienced observers just back from Russia.



EFFICIENCY

The 450 ton portable ingot stripper by PITTSBURGH permits the use of overhead cranes with maximum *efficiency*. The crane is free for other work when the stripper is not in use.

Efficient operation is the primary object in the design and construction of all products produced by Pittsburgh Engineering & Machine Company.

We welcome the opportunity to consult with you on your requirements for mills and auxiliary equipment.

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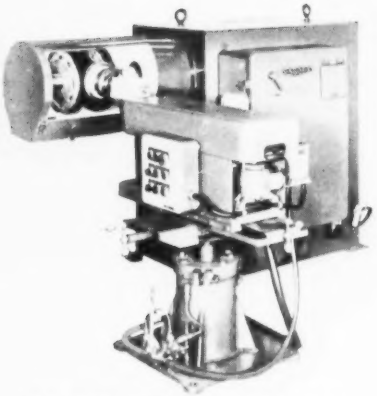
All burrs are thoroughly removed and surface junctures blended to close uniformity. Cost with Brushamatic: 1.3¢

Quality when the pressure's on

. . . but costs 91% less when finished with OSBORN Brushamatic® Methods



OSBORN BRUSHAMATIC® 3-A
operates on preset time cycles.

These port plates for hydraulic pumps are quality finished to precision tolerances to provide positive seal against high internal fluid pressures. For peak dependability in severe hydraulic service, surface junctures are uniformly blended in one simple, automatic operation with Osborn's Brushamatic Machine. At the same time, all burrs are thoroughly removed to eliminate subsequent fouling of hydraulic controls.

Production rate . . . both sides finished, 180 pieces per hour with Osborn Matic® Brushes.

Low cost, precision finishing like this may be applied to many types of products you now build. An **O**sborn **B**rushing **A**nalysis, made in your plant at no obligation, can show you how to speed production . . . cut costs . . . improve product quality. Write us for details—and for your copy of the 20-page Brushamatic booklet. *The Osborn Manufacturing Company, Dept. F-64, Cleveland 14, Ohio.*

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...Resists Combined Attack of Heat and Corrosion
...Directs and Saves Heat

Truck mufflers made of ALUMINIZED STEEL increased service life five times

Here's a typical example of the extra product life offered by Armco ALUMINIZED STEEL® Type 1 . . . the special steel that withstands destructive combinations of heat and corrosion:

A major truck fleet in Nashville, Tennessee, reports *five times longer service life* for mufflers made of ALUMINIZED STEEL than for carbon steel mufflers previously used.

Many products besides mufflers have also been improved by this special steel. Parts of heaters, furnaces, stoves and ranges—serving where heat and corrosive gases make short work of plain carbon steels—last longer when they're made of Armco ALUMINIZED STEEL Type 1.

Reflects radiant heat, too

The inner body of this rotisserie is made of Armco ALUMINIZED STEEL Type 1 because, up to 900 F, this aluminum-coated steel reflects about 80 per cent of the radiant heat that meets it. Many manufacturers design appliances to take advantage of this reflectivity as well as the high strength of ALUMINIZED STEEL. Depending on requirements, it may be used to hold heat in, or to direct heat where it's wanted.

If your products must resist combinations of heat and corrosion, or reflect heat efficiently, it will pay you to consider Armco ALUMINIZED STEEL Type 1. Call our nearest sales office or write us for full information at the address below.

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SHEFFIELD STEEL DIVISION • ARMCO DRAINAGE & METAL PRODUCTS, INC. • THE ARMCO INTERNATIONAL CORPORATION

Anti Anti-Egghead?

Yes, But Let's Do It Calmly

Now we are putting the scientists on a pedestal. We are crediting them with the ability to produce miracles. And what's more, we will soon be demanding that they produce one every hour on the hour.

It is good that we are changing our attitude towards eggheads, scientists, teachers, physicists, chemists, and all others who have been doing a far better job than they got credit for doing.

But we will probably over-do the whole thing. The scientist who is worth his salt is getting part of his pay through a sense of achievement—perhaps he needs more money, too. He may not be in the pure research laboratory for the simple reason that we forced him to worship the god of security.

Since unions and the government caused companies to add fringes in the form of sick leave, pensions, unemployment benefits, long vacations, coffee breaks and the right to call the boss names, what more can we expect? Scientists have emotions—they are human and fallible.

Now that we have all these fringes and business has its share of white-coated actual and potential Louis Pasteurs, what happens? We still have those dedicated men who are giving their lives to research, to government, to science, to teaching, and to their fellow men.

A flock of news stories and impassioned pleas from Washington won't beat the Russians over night. There must be the urge, the desire and the ability before we have the budding scientist. We must have the leadership to fire the ambition of these upcoming eggheads. And we must provide rewards commensurate with the achievement—probably faster than is now the case.

But all this is no reason to act as though the scientist is now God's chosen; that he must be elevated above all others and that we must cater to his every wish.

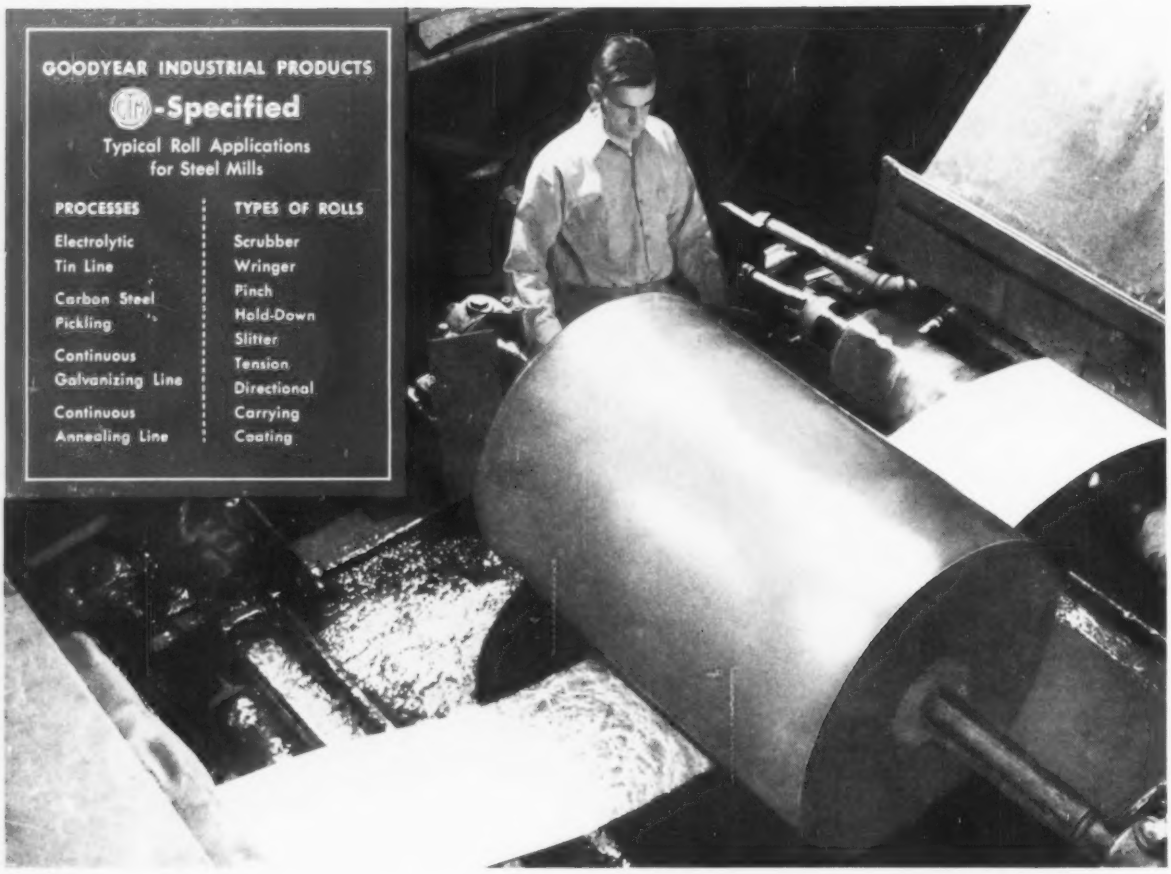
The scientist needs the assistant. The assistant needs the office boy or girl. The company head needs the engineer. The engineer needs the president of the firm. The latter needs money from stockholders. The government needs taxes and support of the people. The people need each other's contribution.

Let's get our scientists, our program for the future, more pay for teachers and more chances for deserving students. But in doing this let's not forget our ultimate aim: To keep freedom, else we fight a losing cause.

Let's think this out—rapidly but completely; unselfishly and intelligently.

Tom Campbell

Editor-in-Chief



Want to roll up higher profits?

One way to roll up higher profits is to cut costs. And one way to do that in metal treating is to use rubber covered rolls specified by the G.T.M. —Goodyear Technical Man.

Goodyear rubber covered rolls are not made just by anyone. Their maximum performance depends upon a specialized knowledge of rubber compounding, rubber-to-metal bonding and precision manufacture – the type of knowledge personified by the G.T.M.

Remember, too, when you talk to the G. T. M. you are talking to a corps of compounders and processors of rubber. And it's their almost 45 years' experience in industrial rubber that results in just the right compound, the lasting bond and the precise finishing needed for maximum, trouble-free roll life.

Why not talk to the G.T.M. the next time you need rubber covered rolls? You'll find it will pay off in longer life and less down time or lower costs and higher profits. You can contact him through your Goodyear Distributor or by writing Goodyear, Industrial Products Division, Akron 16, Ohio.

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IT'S SMART TO DO BUSINESS *with your Goodyear Distributor. He can give you fast, dependable service on Hose, V-Belts, Flat Belts and many other industrial rubber and nonrubber supplies. Look for him in the Yellow Pages under "Rubber Goods" or "Rubber Products."*

LETTERS FROM READERS

Short Term Jitters

Sir—This is a short note by way of expressing my appreciation for your very excellent editorials. Special reference at the moment is to "Short Term Jitters" in the Nov. 21 issue.

This is excellent work! Our appreciation for the excellent magazine you publish.—H. Frommelt, Director, Spring Garden Institute, Phila.

Sir—So Mr. Martin "quit leaning against a wind that wasn't there"—wish I had said that.

Congratulations on the high caliber of your editorials. I'm only an engineer but can't get along any more without a copy of The IRON AGE of my own.

Please may I have a couple reprints of your splendid article on the market in Venezuela?—E. W. Allen, Birmingham.

▪ Copies are on the way.—Ed.

Meteorite Popularity

Sir—Please send me as many reprints as you permit of the article on meteorites which begins on p. 131 of the Dec. 5 issue.

The reason I want a large quantity of these reprints is that I am president of The Meteoritical Society, the AAAS affiliate society which deals with the science of meteorites; and at the same time I am president of The Barringer Crater Co., the company which owns and is engaged in developing the Barringer Meteorite Crater in Arizona—which is referred to in the article as the Canyon Diablo Crater.

The article is an important contribution to the science, in that it states in very simple terms a lot of the basic reasons why the science of meteorites is attaining an increased popularity in these missile-conscious days.—D. M. Barringer, Pres., The Meteoritical Society, Philadelphia.

Not Fog Bound

Sir—It's impossible to describe my reaction to your Nov. 14 editorial (Full Mobilization: It's More Than Just Things).

I just didn't think a beautiful thing like that could ever climb out of the technical fog of an industrial journal. It is good to learn that men are using their talent to unite spiritual and material values—with the necessary emphasis.

You're heroic to print this message in the market place.

What kind of reception did the piece receive? My guess is, not much. If you get a chance, I'd like to learn if I'm right, and I hope not.—F. J. Clark, Editor, Kaiser Builder, Kaiser Engineers, Oakland, Calif.

▪ We're happy to tell Mr. Clark many others share his views.—Ed.

Sir—Will you please send me one or two reprints "How To Get More For Your Metalworking Dollar: Copper and Brass" and the charts that appeared in your Sept. 5 issue?

It is indeed an excellent summary. —F. H. Twiest, Chief Engr., Wolverine Brass Works, Grand Rapids.

"I'd like you to meet the head of our grievance committee."

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Come complete with line-up pins ready to attach to your die set.

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SOLVE YOUR DIE MAKER SHORTAGE
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ALL QUOTATIONS ANSWERED THE SAME DAY WE RECEIVE THEM

MINIMUM PRODUCTION ON STEEL AND SIMILAR METALS

THICKNESS	MINIMUM	MAXIMUM
1 32 STEEL	100,000	UNKNOWN
1 16 STEEL	100,000	UNKNOWN
3 32 STEEL	75,000	UNKNOWN
1 8 STEEL	50,000	UNKNOWN

MAXIMUM UNKNOWN AS DIES HAVE NEVER BEEN RUN TO DESTRUCTION

MINIMUM PRODUCTION ON ALUMINUM AND SIMILAR METALS

THICKNESS	MINIMUM	MAXIMUM
1 16 ALUMINUM	125,000	UNKNOWN
3 32 ALUMINUM	100,000	UNKNOWN
1 8 ALUMINUM	75,000	UNKNOWN
5 32 ALUMINUM	50,000	UNKNOWN
3 16 ALUMINUM	40,000	UNKNOWN

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OVER A QUARTER OF A CENTURY OF DIE MAKING SERVICE TO INDUSTRY

FATIGUE CRACKS

Strong Talk

Two geneticists met at an annual convention. "I've just bred a parrot with a tiger," said one.

"Oh, really," said the other. "What does it say?"

"I don't know," replied the first. "But when it talks, I listen."

Author Campbell

Tom Campbell, editor in chief, The IRON AGE, has written a monograph on the iron and steel industry. In his usual hard-hitting style, Tom manages to pack a lot of facts and history into 40 pages.

Published by Bellman Publishing Co., Cambridge, Mass., the monograph goes into job opportunities in iron and steel, how the industry operates, how to prepare for a job in steel, the advantages and disadvantages of working in the industry, and pay and working conditions in the field of steelmaking.

Summing Up—Here's how Tom sums up the job outlook in steel:

"The future of the steel industry appears to suggest a stable job with many chances to progress from so-called skilled worker jobs to management and sales positions. There is no clear-cut obstacle to any position in steel.

This is evidenced by salesmen who once were steelworkers in the openhearth departments; managers who started out as accountants; department heads who at one time were machinists, boilermakers, or inspectors . . ."

New Puzzler

Many thanks to N. N. Schneider, The Creamery Package Mfg. Co., Lake Mills, Wis., for this little teaser: An auto driver travels a mile uphill at 30 mph. How fast must he travel a mile downhill to have averaged 60 mph for the two-miles trip?

NEG	FRI	FRI	THU	WED	TUE	MON
8	7	6	5	4	3	2
16	15	14	13	12	11	9
23	22	21	20	19	18	17
31	30	29	28	27	26	24
38	37	36	35	34	33	32

Business Calendar

Here is a calendar dear to the heart of everyone involved in filling a customer's needs. It comes to us from Granger Davenport of Gould & Eberhardt Co. via the AGMA NewsDigest. Details follow:

1. Every job is in a rush. Everyone wants his order yesterday. With this calendar, a customer can order his work on the 7th and have it delivered on the 3rd.

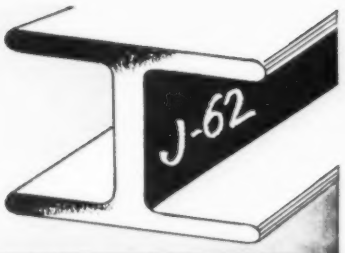
2. All customers want their jobs on Friday so there are two Fridays in every week.

3. There are seven days at the end-of the month for those end-of the month jobs.

4. There will be no "first of the month" bills to be paid as there isn't any "first." The "10th" and "25th" also have been omitted in case you have been asked to pay them on one of those days.

5. There are no bothersome, nonproductive Saturdays and Sundays. No time and a half or double time to pay.

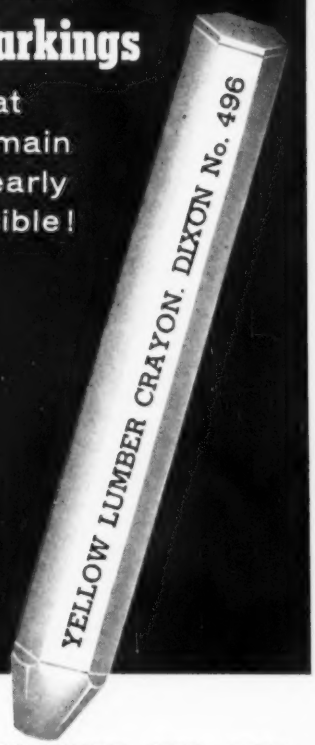
6. There's a new day each week called negotiation day. Contracts may then be reopened each week.



All over America... this crayon means

Vivid Markings

that remain clearly visible!



MARKS LUMBER, STEEL, IRON, CONCRETE . . . . . .

Write for a FREE SAMPLE!
Specify the surface to be marked.

In Red, Yellow, Blue and 9 other highly visible colors

Sold everywhere in Mill Supply Houses, Hardware Supply Firms, Industrial Supply Distributors and Engineering Supply Firms. Be Sure To Specify:

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THE JOSEPH DIXON CRUCIBLE CO.
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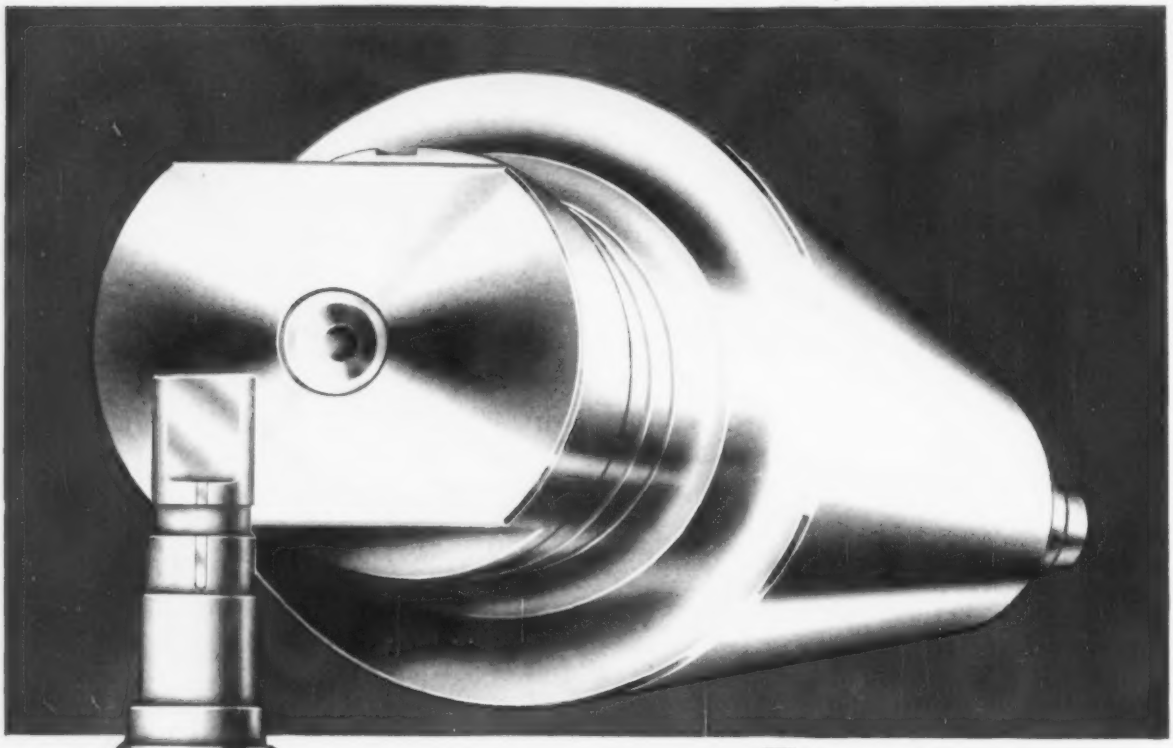
167 Wayne Street, Jersey City 3, N. J.



experience

...one of the unseen extra values you get in every

NATIONAL ROLL

In the final analysis, the quality of a roll is determined by the experience of the maker . . . Experience in metallurgy, experience in casting, experience in heat treating and machining.

For almost fifty years, National has been making rolls for the metal industry throughout the country. And now this experience is backed by the years of metallurgical experience of National's parent organization, General Steel Castings Corporation.

Such experience is your assurance of the best in iron and steel rolls . . . rolls that will give you dependable service, higher tonnages and longer life. Try National rolls and see.

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NATIONAL ROLL & FOUNDRY DIVISION

Avonmore (Westmoreland County) Pennsylvania

General Steel Castings Corporation: General Offices, Granite City, Ill.

Plants: Granite City, Ill.—Eddystone, Pa.—Avonmore, Pa.

EXHIBITS, MEETINGS

Plant Management and Engineering Show—Jan. 27-30, 1958, International Amphitheatre, Chicago.

Packaging Machinery and Materials Show—March 25-28, Convention Hall, Atlantic City, N. J. (Hanson & Shea, Inc., One Gateway Center, Pittsburgh 22.)

JANUARY

Southern Industrial Distributors' Assn.—Midyear meeting, Jan. 6-8, Roosevelt Hotel, New Orleans. Society headquarters, 1626 Fulton National Bank Bldg., Atlanta 3, Ga.

Society of Automotive Engineers, Inc.—Annual meeting, Jan. 13-17, Hotels Sheraton-Cadillac and Statler, Detroit. Society headquarters, 485 Lexington Ave., New York 17.

Malleable Founders' Society—Semiannual meeting, Jan. 17, Hotel Cleveland, Cleveland. Society headquarters, 1800 Union Commerce Bldg., Cleveland.

Institute of Scrap Iron & Steel Inc.—Annual meeting, Jan. 19-22, Eden Roc, Fontainbleau, and Deauville hotels, Miami Beach, Fla. Society headquarters, 1729 "H" St., N. W., Washington 6, D. C.

Truck Trailer Manufacturers Assn.—Annual meeting, Jan. 20-22, Palm Beach Biltmore Hotel, Palm Beach, Fla. Society headquarters, 710 Albee Bldg., Washington 5, D. C.

American Road Builders' Assn.—Annual meeting, Jan. 20-23, Sheraton-Park Hotel, Washington. Society headquarters, 600 World Center Bldg., Washington 6, D. C.

American Institute of Electrical Engineers—Winter meeting, Jan. 20-24, Hotel Statler, New York. Society headquarters, 33 West 39th St., New York 18.

Steel Shipping Containers Institute, Inc.—Winter meeting, Jan. 21-22,

(Continued on P. 16)

Get off-the-shelf delivery on

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Induction Hardened*
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Federal Machinery Co.—CAnal 6-3022
H. Weiss & Co.—CAnal 6-4256

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Milton Equipment Co.—WAlnut 2-1734

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Pearl Equipment Co.—CHapel 2-5476

TEXAS—Dallas
Briggs-Weaver Machinery Co.
LAkeside 8-0311

Fort Worth
Briggs-Weaver Machinery Co.
EDison 6-5621

Houston
Mehl Mchry., Inc.—FAirfax 3-1313
Wessendorff, Nelms & Co.—CApitol 7-8181

WASHINGTON—Seattle
Pacific Metal Co.—MAin 6925

WISCONSIN—Eau Claire
Production Equip. Co.—TEmple 2-3483

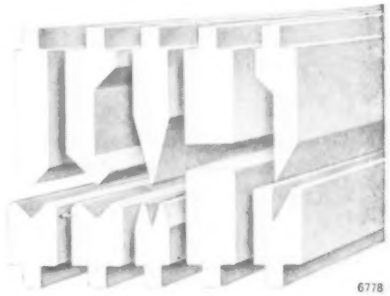
Milwaukee
F. W. Burns Mchry. Co.—FRanklin 4-1540
Production Equip. Co.—GReenfield 6-6075

*Induction hardening is a special, high-frequency process used to harden the wear surfaces of CHICAGO dies. Field reports on CHICAGO *induction hardened* dies show up to ten times longer life than conventional press brake dies.

This country-wide organization of local dealers offers immediate delivery on many CHICAGO *induction hardened* press brake dies. These stock dies are economical, and the quick delivery saves time in tooling. They are available in any length from 4 to 12 feet in increments of 2 feet.

Stock dies are used for a surprisingly large variety of bending operations. And, with CHICAGO *induction hardened* dies you get bonus performance and increased die life at no extra cost. Remember, these dies can be used in any make or size of standard press brake.

On your needs for press brake dies, call your nearest dealer listed here. With Bulletin D-455 you can order by number. Ask for copy.



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Hand and Power Bending Brakes • Special Metal-Forming Machines

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Eastern supplies more tonnage of more types of stainless steel sheets and plates for aircraft, missiles and rockets than any other exclusive producer in the world.

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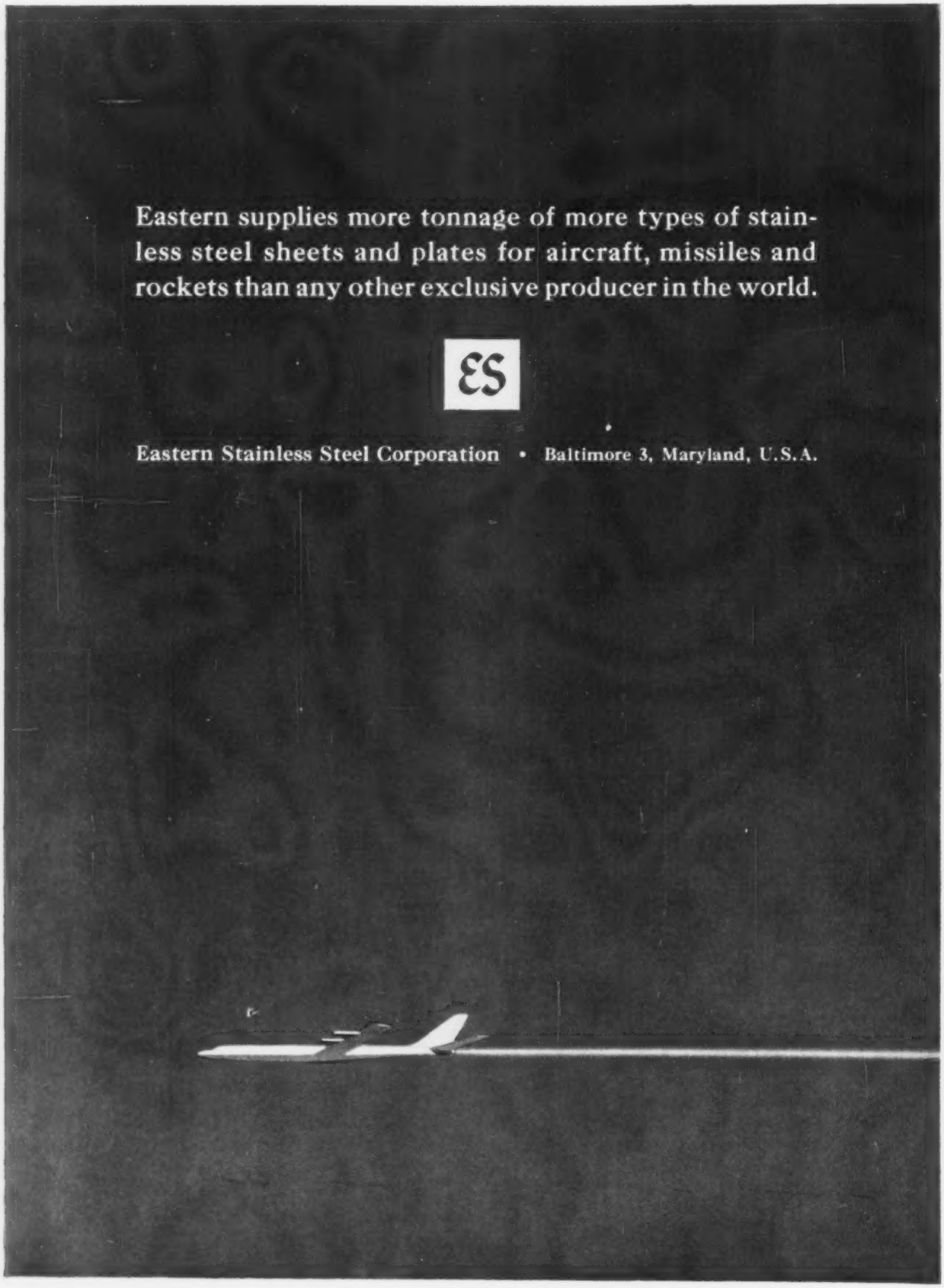

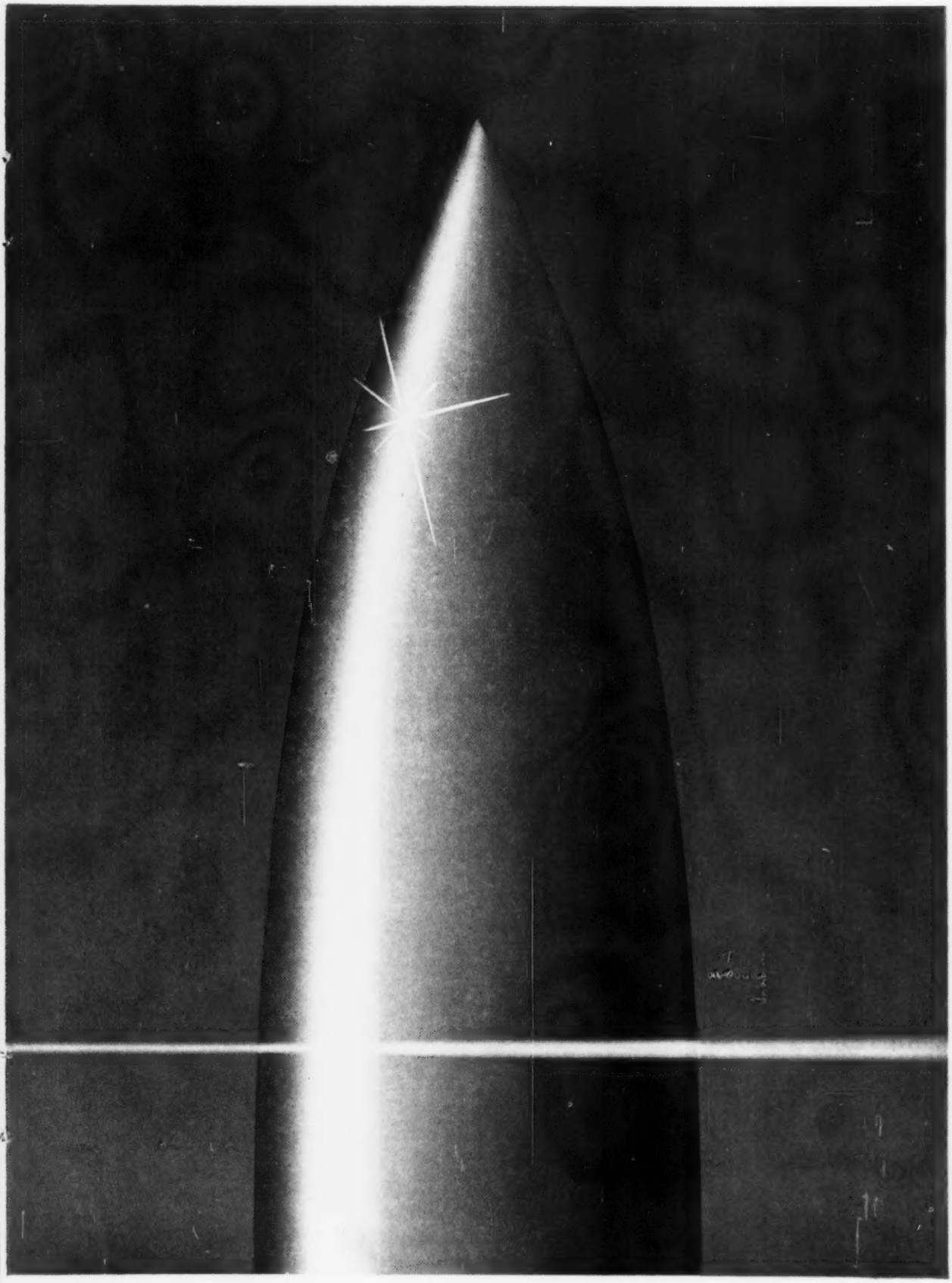

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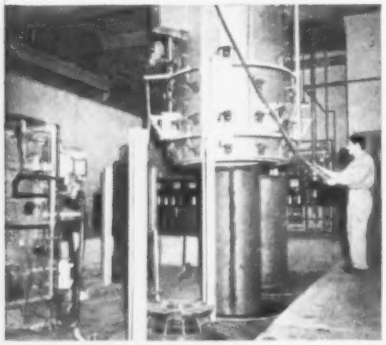
Normalizing?
Nitriding?
Spheroidizing?

You can't beat

CONTINENTAL TOP HAT



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Faster and More Uniform Heating Rate

Extra large volume of recirculating atmosphere.

Highest Production per Unit

Versatility

Can be used for bright annealing, normalizing, nitriding, or spheroidizing coiled wire or strip—ferrous or nonferrous.

High Efficiency

No radiant tubes.

Long Hood Life

No flame impingement.

Full particulars and recommendation for any job on request.

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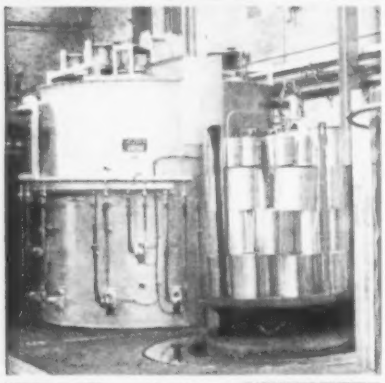
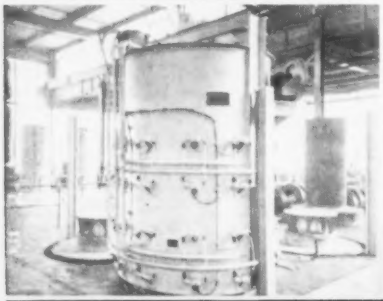
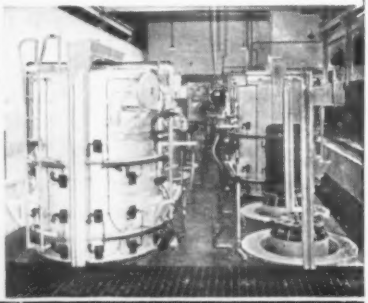






Over One-Third of a Century of Progress in
FURNACES · PRODUCTION LINES · SPECIAL MACHINES · COMPLETE PLANTS

CONTINENTAL INDUSTRIAL ENGINEERS, INC.
176 West Adams Street, Chicago 3, Illinois

EXHIBITS, MEETINGS

(Continued from P. 13)

St. Regis Hotel, New York. Society headquarters, 600 Fifth Ave., New York 20.

Association of Steel Distributors, Inc.—Convention, Jan. 26—Feb. 2, Algiers Hotel, Miami Beach, Fla. Society headquarters, 29 Broadway, New York 6.

Industrial Heating Equipment Assn.—Annual meeting, Jan. 27-28, Penn-Sheraton Hotel, Pittsburgh. Society headquarters, 1145 19th St., N. W., Washington 6, D. C.

February

Malleable Founders Society—Technical and operating conference, Feb. 6-7, Wade Park Manor, Cleveland. Society headquarters, 1800 Union Commerce Bldg., Cleveland.

American Society for Quality Control—Annual conference on management by exception, Feb. 7-8, Carter Hotel, Cleveland. Information: B. F. Goodrich Chemical Co., 3135 Euclid Ave., Cleveland.

Institute of Surplus Dealers—Annual trade show and convention, Feb. 14-17, New York Trade Show Bldg., New York. Society headquarters, 673 Broadway, New York 12.

American Institute of Mining, Metallurgical & Petroleum Engineers—Annual meeting, Feb. 16-20, Hotels Statler and Sheraton-McAlpin, New York. Society headquarters, 29 W. 39th St., New York.

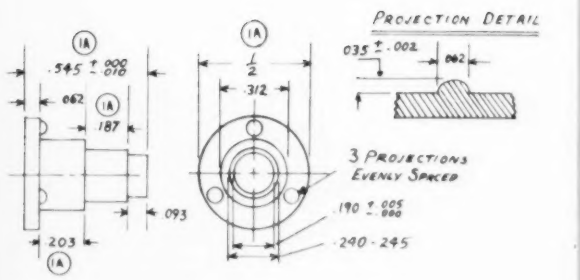
MARCH

American Machine Tool Distributors' Assn.—Spring Meeting, March 10-11, The Roosevelt, New Orleans, La. Society headquarters, 1900 Arch St., Philadelphia 3.

Steel Founders' Society of America—Annual meeting, March 17-18, Drake Hotel, Chicago. Society headquarters, 606 Terminal Tower, Cleveland 13.

from 5 Expensive Operations to—

2 blows!



Shaft for nylon rollers used in cabinet drawers. The blank formerly was made in 4 cuts on a screw machine — then the 3 tiny projections which anchor the nylon rollers were spot welded. Now Milford cold heads the part from Keystone "XL" Wire with one secondary operation to turn the small tenon. The two major shoulder diameters, head and projection, are produced in just two blows.

The MILFORD RIVET & MACHINE CO. finds Keystone Wire saves 70% in Costs . . . 85% in Time

Here is a typical example of how Milford uses Keystone "XL" Wire in meeting difficult cold upsetting requirements. Milford estimates that savings of 70% in cost and 85% in time have been effected by cold heading the part illustrated above as compared with the four operations it formerly took on a screw machine plus spot welding. Milford puts Keystone "XL" Wire to work at its five plants – Elyria, Ohio; Milford, Conn.; Hatboro, Pa.; Aurora, Ill.; and Norwalk, Calif. Milford recognizes *flowability* of Keystone "XL" Wire as the key to profitable runs of quality fasteners.

Manufacturers come to Milford with specific fastener requirements – then skilled Milford engineers design quality cold-formed parts. Here's where *teamwork* pays off. Milford and Keystone representatives find the most practical solution to metallurgical problems. This results in high quality – yet economical parts – fabricated perfectly for the job they were designed to do.

Close counsel and analysis of your wire problems are services you receive from your Keystone representative. Call him today!

Keystone Steel & Wire Company, Peoria 7, Illinois

KEYSTONE
WIRE FOR INDUSTRY

Keystone Steel & Wire Company
Peoria 7, Illinois

Brand New . . . COLD HEADING FACTS FOLDER . . . send coupon today! New folder discusses uses, applications, methods, technical facts, wire requirements.

Name_____ Title_____

Company_____

Street_____

City_____ State_____

You wouldn't cut out paper dolls with a hedge clipper!!

Then why shear 6-inch wide material with a 10-foot shear?

Cutting a small piece of light metal, plastic or rubber on a big shear is even more expensive than it is exasperating. Yet many shops, out of necessity, tie up big shears with small work.

That problem is solved by the New Lodge & Shipley 24" Speed Shear. Specially designed for fast cutting of small pieces, it has a capacity of 1/8" x 24" mild steel. Its unique work table is provided with holes which allow fast set-up of guides, templates and protractors for production of straight-side blanks at speeds up to 120 strokes per minute.

A 24" Speed Shear may easily pay for itself merely in freeing a big shear from wasteful small jobs. Investigate its possibilities in your plant. For detailed Bulletin No. PS-12, write: **The Lodge & Shipley Co., 3073 Colerain Ave., Cincinnati 25, Ohio**

Lodge & Shipley

Delicate appetite for a "Queen" . . .

80 TONS IN ONE BITE!

But look at the size of her! Taller than a 13-story building, and weighing 2,400 tons, this lady is entitled to a queen-size appetite. She's the *River Queen*—largest power shovel ever built by the Bucyrus-Erie Company. And her huge, 80-ton-capacity bucket is made of tough USS "T-1" Steel to keep her eating regularly for a long time. Backed by 15 powerful motors and fronted by a formidable row of ripping teeth, the "Queen's" huge maw scoops up 55 cu. yds. of overburden at a gulp and dumps it nearly 300 feet away from the digging point. Digging and dumping in less than a minute, the *River Queen* could pile up a mountain of more than 100,000 tons of overburden in 24 hours!

This big shovel is being used to uncover two seams of coal for W. G. Duncan & Peabody Coal Companies in western Kentucky. When the mine is in full operation, its output is expected to be 2 million tons of coal annually. The "Queen" will be highly instrumental in making this possible.

With all the weight and mechanical muscle the big shovel possesses, her dipper has to be a real battering ram. That's why it's made of USS "T-1" constructional alloy steel. Biting and ramming through rock and earth, hour after hour, day after day, is punishing service. USS "T-1" Steel is designed to take this kind of impact, shock and abrasion. And its amazing toughness never falters, even at temperatures far below zero.

The very high yield strength of USS "T-1" Steel—90,000 psi minimum—saved tons of weight in the big dipper, making a bigger payload possible with each scoop. And, speaking of strength, the 86-foot dipper handle and the 145-foot boom are made of another U. S. Steel product, USS TRI-TEN high-strength low-alloy steel.

• • •

Perhaps you need a steel that offers high strength, extraordinary toughness, resistance to impact abrasion, or good creep rupture strength combined with ease of fabrication. USS "T-1" Steel is your answer, and we'll gladly help you adapt it to your particular application. United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

United States Steel Corporation, Pittsburgh · Columbia-Geneva Steel Division, San Francisco
Tennessee Coal & Iron Division, Fairfield, Ala.
United States Steel Supply Division, Warehouse Distributors, Coast To Coast
United States Steel Export Company, New York

USS "T-1" CONSTRUCTIONAL ALLOY STEEL

USS, "T-1," and TRI-TEN are registered trademarks.

UNITED STATES STEEL

Pressurizer for designed with stainless

The reactor we are talking about contains a fissionable nuclear core through which passes thousands of gallons of water per minute at elevated temperature and pressure. This pressurized radioactive water transfers heat from the reactor core to a shell and tube type steam generator which in turn produces non-radioactive steam in the secondary system for power turbine operation.

As power requirements change, the temperature of the primary water is maintained by moving neutron absorbing reactor control rods in or out of the reactor. Resulting pressure and volumetric changes of the primary water system must be controlled, and this is the job of the pressurizer vessel.

When the primary system water pressure drops, high-capacity back-up immersion heaters at the bottom of the pressurizer go into action to heat the water and generate more steam and maintain pressure. When the primary system pressure goes *up*, water sprays inside the pressurizer are activated to collapse the steam bubble, thus reducing the pressure and permitting positive water surges from the primary system. Since the walls are alternately exposed to wetted and vaporous conditions at high temperatures, a severely corrosive environment exists. Corrosion in this vessel could result in a hazardous level of radioactivity throughout the primary side of the plant. The choice of a proper steel to insure against this hazard was a major consideration. This is why the pressurizer was designed with stainless steel.

Electric furnace and metallurgical staffs worked together to obtain the precise chemical composition specified. Great care was taken during processing in the electric furnace shop. Then, forge press crews, heat treaters and machinists combined skills to produce the finished rings, which certainly rank among the finest USS Quality Forgings ever produced.

Your USS Quality Forging order makes use of the same steel-making facilities, the same processing equipment, and most important, your forging is made by the same skilled workmen in our Homestead Forgings Division.

If you'd like to inquire about a USS Quality Forging made under these conditions, or if you'd like our free 32 page booklet on the subject, please write to United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.

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heavy machinery parts... carbon, alloy, stainless
forged steel rolls and back-up roll sleeves
electrical and water wheel shafts
specialty forgings of all types

UNITED STATES STEEL

nuclear reactor system steel USS Quality Forgings

U. S. Steel Supply's flame-cutting service

reduces handling and machining costs

THE PICTURE ABOVE shows an ultra-modern automatic flame-cutting machine *pre-shaping to exact specifications* an order of plate steel for a U. S. Steel Supply customer. And saving him plenty . . . by reducing his handling and machining costs . . . and by improving both the *quantity* and the *quality* of his output.

You'll find the latest custom-cutting equipment, including costly flame-cutting machines in all of our 18 warehouses. By using our facilities, you eliminate the need for installing and maintaining equipment of this type in your plant . . . and thereby materially reduce your capital investment in shop equipment.

If you would like to know about the time-and-money-saving advantages of buying your steel from U. S. Steel Supply, contact our nearest warehouse or direct your inquiry to our General Offices in Chicago.

U. S. STEEL SUPPLY

DIVISION

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General Offices:
208 So. La Salle St., Chicago 4, Ill.

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UNITED STATES STEEL

FROM RECEIVING ROOM

...TO STOCK CRIBS

...TO PRODUCTION LINE

...TO FINISHED PRODUCT

SAVE SPACE, TIME AND MONEY

with H-K's socket screw packaging!

At every step of the way through your plant, Holo-Krome's new and different packaging pays off with a handsome bonus in SPACE . . . HANDLING TIME . . . EFFORT . . . PROTECTION!

For the finest in socket screws . . . for unmatched SAME-DAY SERVICE . . . for cost-cutting packaging—look to Holo-Krome!

See your authorized H-K Distributor for more information.

HOLO-KROME SOCKET SCREWS

A BONUS IN TIME

Compact, easy-to-handle Pre-Pak Cases can be stocked easier and quicker. Users report checking and receiving time cut by ⅓.

A BONUS IN SPACE

Modular Pre-Pak Cases fit standard shelving to save stock room space. You take inventory at a glance, reduce orders and errors.

A BONUS IN HANDLING

Smaller, more compact boxes can be stocked faster and safer than old-fashioned boxes. Easily read labels assure tighter inventory control.

A BONUS IN PROTECTION

Sturdy ONE-PAKS and TEN-PAKS protect the *entire* socket screw from damage. H-K products arrive at the production line with perfect head, thread and finish.

THE HOLO-KROME SCREW CORP · HARTFORD 10, CONN., U. S. A.

This **SCREW** requires ductile wire!

The superior ductility of Chase wire makes forming easier on big-head screws or rivets.

Chase makes wire

THE CHASE WIRE SERVICE MAN, W. F. Schmollinger, our wire mill superintendent, heads our team of experts... spends his time solving *your* problems. Often in the field, working with engineers and shop foremen, he has helped many manufacturers of cold-headed parts to make a finer product!

This **BOLT**
requires
high-strength wire!

High-strength Chase wire for square and hexagonal head bolts makes a finer quality product.

This **WOOD SCREW**
requires
"in-between" wire!

Some items, like wood screws, call for wire with both high strength and ductility

to fit your product!

WHAT DO YOU NEED IN WIRE?

Ductility? High strength? Perhaps a certain amount of both? Chase makes a variety of alloys and tempers, to meet most every production requirement. But if Chase doesn't already make it, we'll *product-engineer* wire for your individual needs!

It's a unique Chase service! Although Chase wire is quality-controlled and free from imperfections, even the best wire can't do a perfect job unless it's the right alloy and temper for *you*.

So before you order wire again, get in touch with Chase. Tell us just what you do with wire ...what properties you look for...describe any problems you may be having. Send us samples or drawings of your product. By studying your individual requirements, trained Chase technicians can help you gain greater efficiency and economy in production.

Contact the Chase Wire Service Man through the warehouse or office nearest you!

Chase

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WATERBURY 20, CONNECTICUT
SUBSIDIARY OF KENNECOTT COPPER CORPORATION

The Nation's Headquarters for Brass, Copper and Stainless Steel

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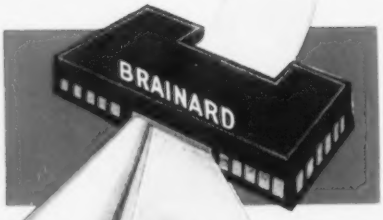
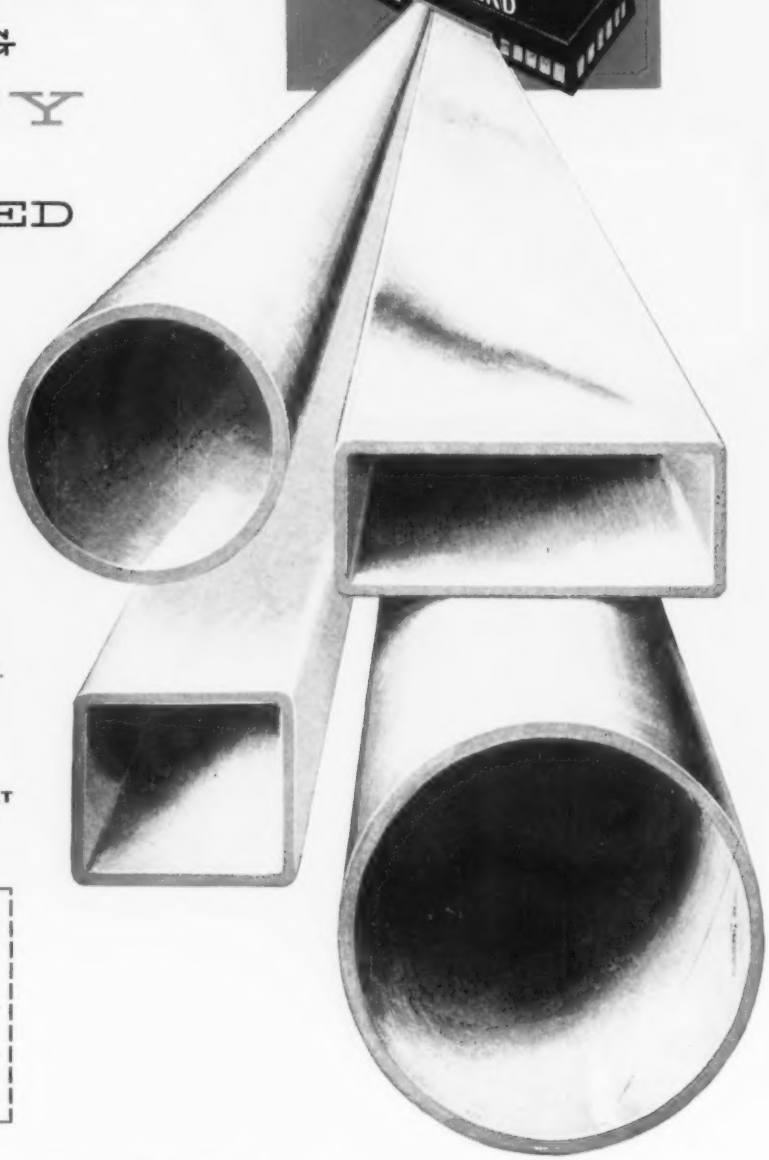
IN BRAINARD STEEL TUBING QUALITY IS ASSURED





As a division of Sharon Steel, Brainard can be sure the steel used for the fabrication of tubing has been developed to meet their own exacting standards. From mine to finished product, Brainard Welded Steel Tubing has the extra quality that can come only from an integrated industry.

Brainard Electric Welded Steel Tubing, from ½" to 4" in diameter, is also available in squares, rectangles and many special shapes. Brainard Tubing can be furnished swedged, pressure tested, or fabricated.

For mechanical welded steel tubing of top value, buy Brainard.

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For complete information on Brainard's Mechanical Welded Tubing.

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Address _____

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Brainard Steel Tubing

SHARONSTEEL

400

Brainard Steel Division, Sharon Steel Corporation
Griswold Street, Warren, Ohio

"You sure this Chlorothene solvent is safe, Chet?"

"Sure, Jess, it's as safe as they make 'em. Of course you don't drink Chlorothene® or swim in it. You use good common sense in handling any solvent."

"Tell me more. Will it catch fire?"

"No, unlike petroleum solvents, it has no flash or fire point. We use a lot of Chlorothene for cold cleaning, wiping and dipping because it's the safest solvent we can buy."

"Is the toxic hazard from breathing vapors very high?"

"It's one of the safest. Has an M.A.C. rating of 500 ppm. In fact, our Safety Engineer recommended it."

"Guess that takes care of the safety angle."

"Yes, and Chlorothene really takes care of the cleaning angle, too. It's high in solvent power and evaporates fast."

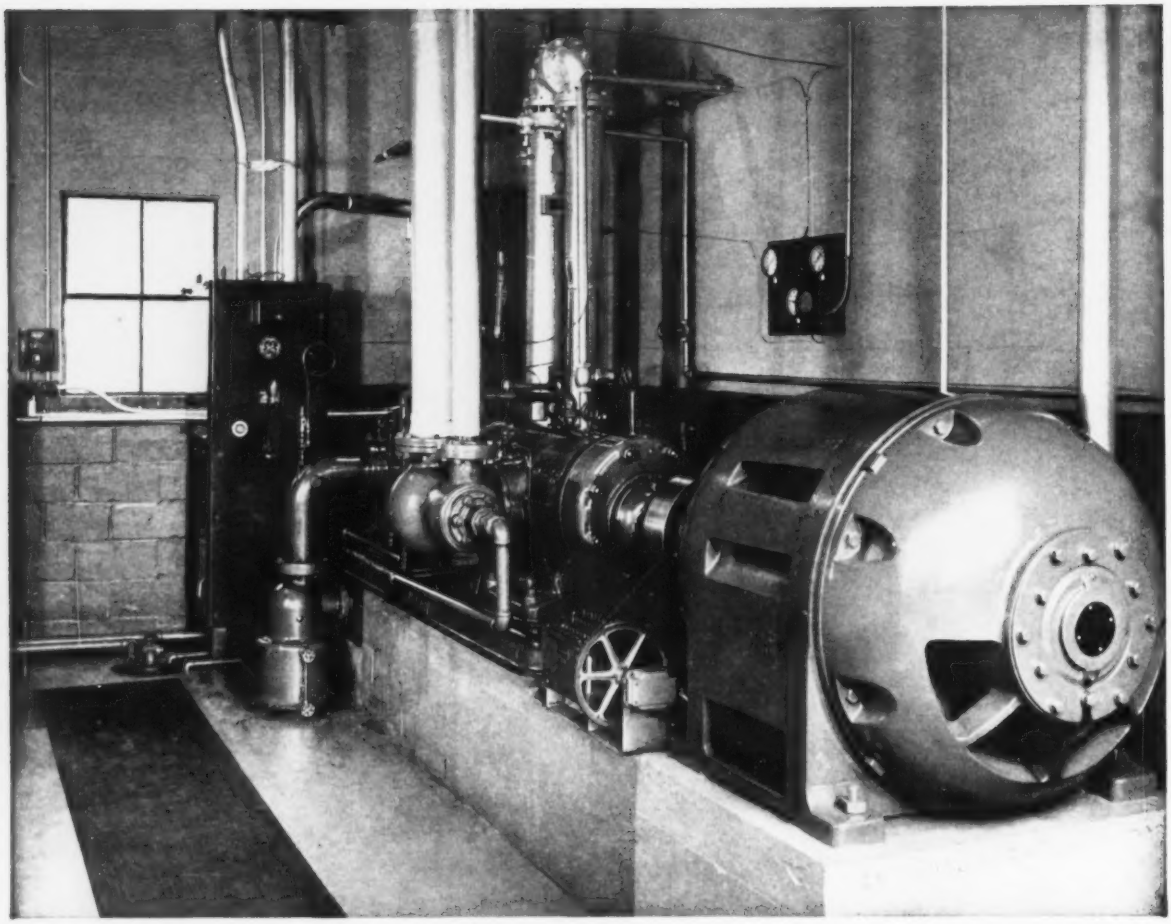
"Say, Chet, did you invent this stuff?"

"Nope. Dow developed it."

"Who?"

"Dow. The Dow Chemical Company, Midland, Michigan. You know, the company that makes the complete line of chlorinated solvents—Dow Trichloroethylene and Dow Perchloroethylene Industrial for vapor degreasing, and Dow Methylene Chloride for stripping and cleaning metals. Why don't you write them for the whole story?"

YOU CAN DEPEND ON DOW



Fuller Rotary Two-Stage Compressor, C135-135H. Capacity 680 c.f.m., 100-lb. pressure, 690 r.p.m., 150 hp. motor.

16,000 HOURS OF OPERATION WITH NO MAINTENANCE

Empire Steel Castings, Inc., Reading, Pennsylvania, installed a C-135-135H Fuller Rotary Two-stage Compressor in April 1953. After 32 months approximately 16,000 hours of operation—the compressor received a routine inspection, when a new set of blades was installed in the higher-pressure cylinder.

The Empire engineers report no downtime since replacement, although they've added 4,000 operating hours. Prior to switching to Fuller, their former experience with compressors was a different story—as many as several overhaulings in one year. With Fuller equipment furnishing a constant high capacity air supply, production costs have been greatly reduced.

Here's how Empire uses compressed air:

- In the molding department, supplying all air for pneumatic rammers, all squeeze and jolt machines, automatic set-out and lifting apparatus of mold conveyors, automatic shake-out machines, mold cleaning and spraying equipment.
- In the core department, for ramming equipment, spraying and torch drying equipment, core oven operation as well as core blowing equipment.
- In the cleaning department, pneumatic chipping hammers and grinders, blacksmith requirements, sand-blasting, pressure testing and miscellaneous tools.
- In the heat-treating department, heat treating furnace operation and cooling equipment.

To get all the facts and engineering data, write today for Bulletin C-5A.

C-298
3662

FULLER COMPANY
122 Bridge St., Catasauqua, Pa.
SUBSIDIARY OF GENERAL AMERICAN TRANSPORTATION CORPORATION
Chicago · San Francisco · Los Angeles · Seattle · Kansas City · Birmingham

Fuller

PIONEERS OF HIGH-EFFICIENCY VANE TYPE ROTARY COMPRESSORS SINCE 1930

the most accurate, the most powerful machines

electric furnaces •
continuous casting mills •
hot ingot peeling machines •
blooming mills •
hot and cold Sendzimir mills •

• complete rolling mills
• complete mills for the production of seamless steel pipes

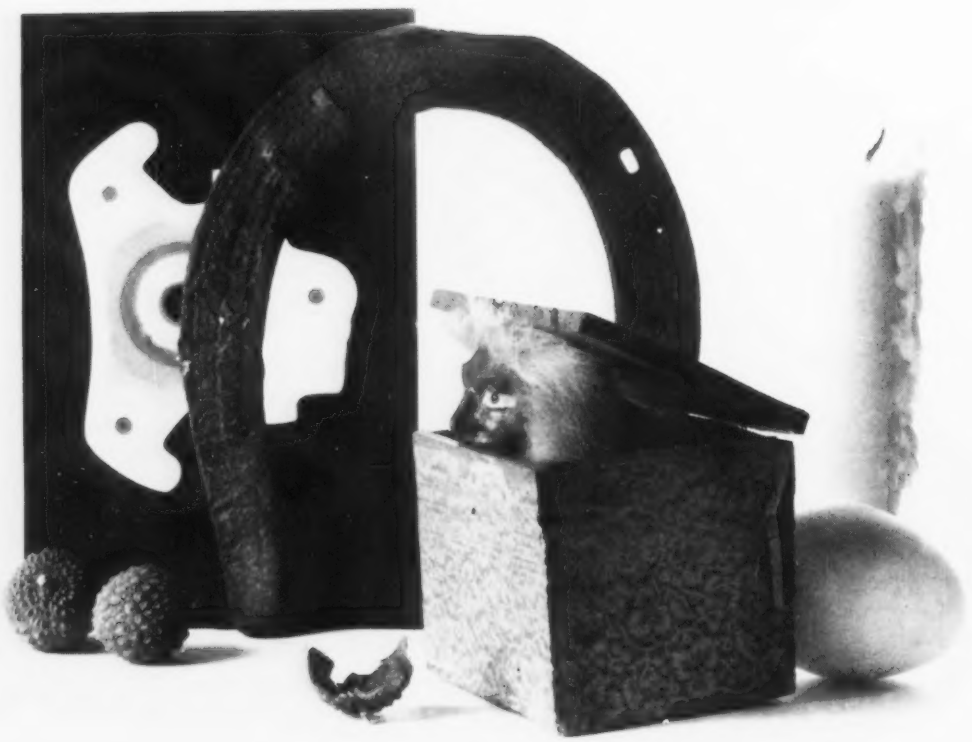
universal • milling and boring machine with movable table and movable column
single, double • and triple action hydraulic and mechanical presses

INNOCENTI

the best known

works: milan - italy

società generale per l'industria metallurgica e meccanica



How to candle a horseshoe!

If castings were like eggs a simple candle would solve all inspection problems.

Getting inside things to "have a look around" is unfortunately a somewhat more critical process.

And since life itself often depends upon the delicate layer of silver that reveals flaws, only an X-ray film having superb gradation and tonal separation can be depended on in routine as well as specialized work.

And tonal separations are the very characteristic that makes Ansco X-ray films special. That's because only Ansco X-ray films are critically coated to tolerances that provide unequalled quality and uniformity. Ansco X-ray films . . . for candling horseshoes!

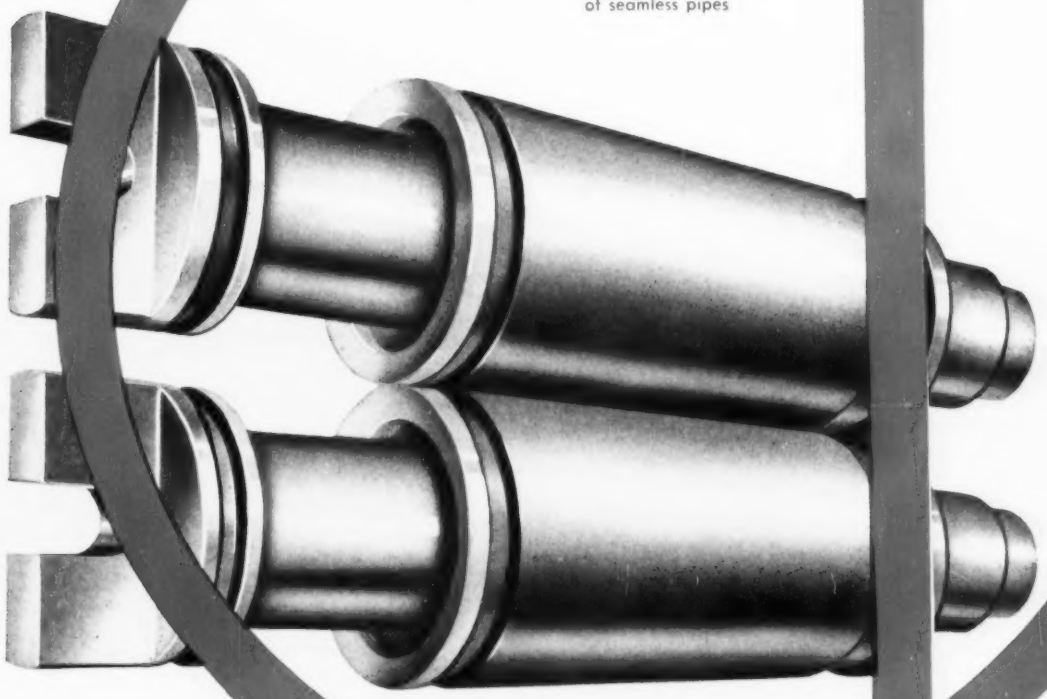
Ansco

X-ray

Ansco, a division of General Aniline & Film Corp., Binghamton, N. Y.

- universal milling and boring machine with movable table and movable column
- single, double and triple action hydraulic and mechanical presses

blooming mills •
hot and cold Sendzimir mills •
electric furnace •
continuous casting mills •
hot ingot peeling machines •
complete rolling mills •
complete mills for the production of seamless pipes •



INNOCENTI

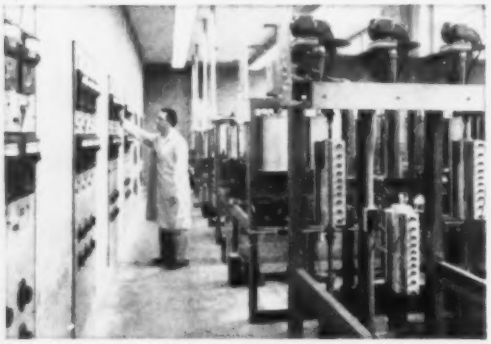
the best known, the most accurate, the most **powerful machines**

works in milan (italy)

ALLOYS ALONE ARE NOT ENOUGH!

The development of new and better alloys or improvements in making and using them is only part of the job at ELECTROMET. The service you get with the alloys you buy is equally important. Here's where ELECTROMET is really unique. Just read the following and see if you're getting the *most* out of your present alloy purchasing program.

FOR INSTANCE... ARE YOU GETTING

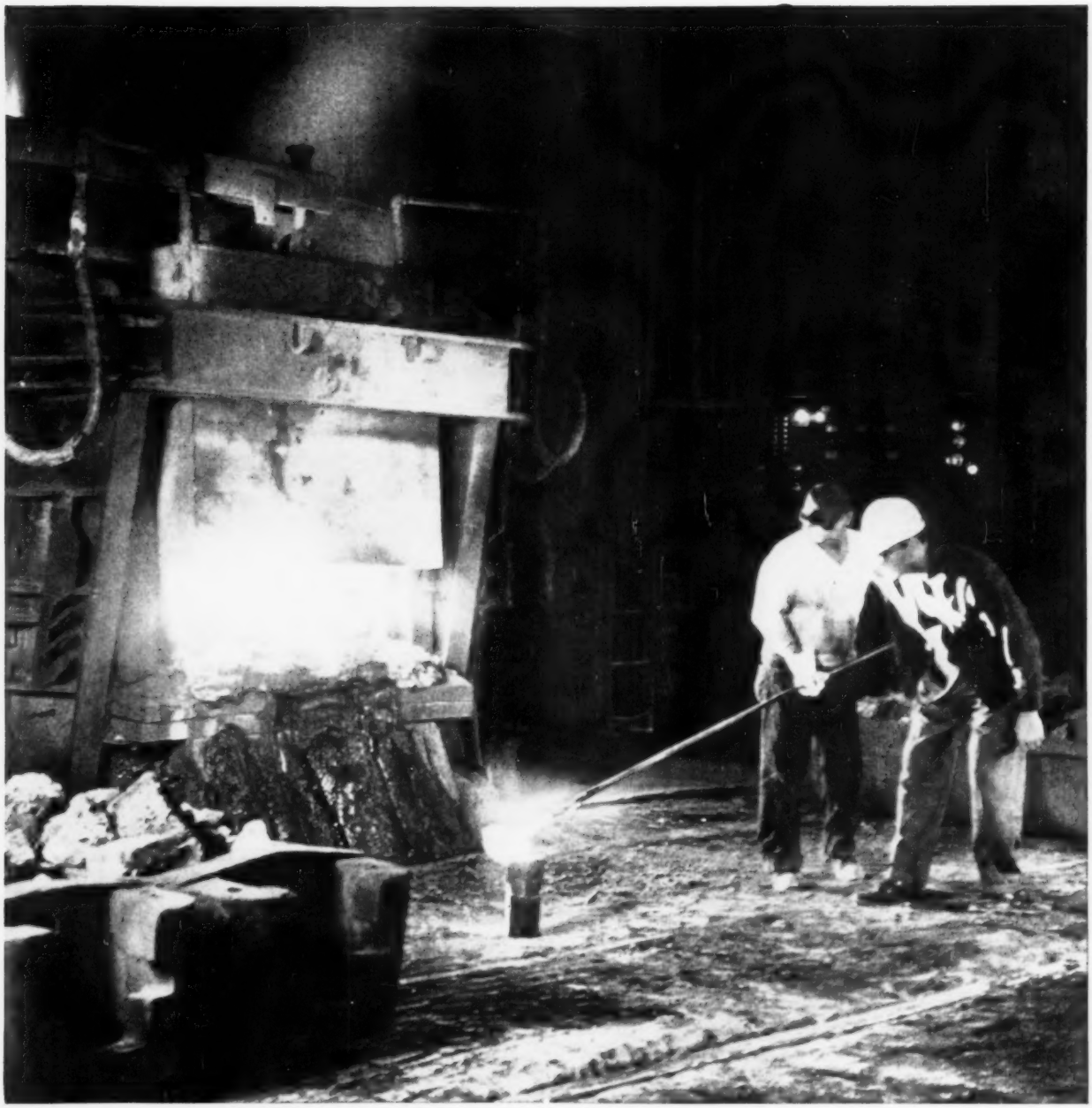


THIS? The combined knowledge of more than 300 skilled engineers and scientists whose experience with advanced technology can help you with your most perplexing alloy-using problems.

THIS? The experience of sales engineers skilled in the most efficient use of alloys . . . ready to quickly call in ELECTROMET specialists on any technical problem that may come up.

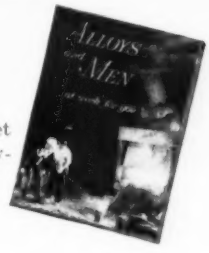
THIS? Assurance of top quality products *every* time. Selection from more than 100 different alloys. Modern, efficient plants convenient to steelmaking centers. Equipment developments that *raise quality standards*, make economies possible.

THIS? Assurance of continuing supplies and fast delivery service from convenient, well-stocked plants and warehouses. The most important alloys are stocked by ELECTROMET near every major metal-producing center in the nation.



ELECTROMET engineers bring you on-the-job assistance in the use of alloys. Their experience backed by the entire ELECTROMET organization is your assurance of satisfaction. We invite you to call us.

You should have this new 28-page booklet about all ELECTROMET facilities and services. Write for your copy today.



ELECTRO METALLURGICAL COMPANY
Division of
Union Carbide Corporation
30 East 42nd Street New York 17, N. Y.

In Canada: Electro Metallurgical Company, Division of Union Carbide Canada Limited, Toronto

Electromet
FERRO-ALLOYS AND METALS

UNION CARBIDE

The terms "Electromet" and "Union Carbide" are registered trade-marks of Union Carbide Corporation.

Studs for NELWELD® process machined from Youngstown cold finished bars

Progressive fabricators rely on the Nelweld method for fast, dependable end-welding of studs to steel surfaces. This novel electric arc process—utilizing flux-filled steel studs—substantially reduces direct fastening costs when used to replace conventional time-consuming methods such as drilling, tapping, hard welding, through-bolting or the securing of straps and rivets.

To maintain their world-wide reputation for product quality and uniformity, Nelson Stud Welding, a division of Gregory Industries, Inc., uses Youngstown Cold Finished Bars as the basic material for stud production.

Youngstown Cold Finished Bars provide high machinability and greater uniformity of composition, structure and surface finish to help you increase production of more uniform parts. Always specify Youngstown—it's your best assurance of quality.

Why not call or write your nearest Youngstown District Sales Office today for additional information or metallurgical assistance?

Close-up of studs being bored to accomodate their charge of flux (top collet) and then cut-off (center collet). Two finished Nelweld studs, shown in the pan in foreground, were machined simultaneously in the 6-position machine. First operation—feed out and face; second—bore; and third—cut-off.

Set-up man is loading 1¼-inch diameter Youngstown Cold Finished Bars into a 6-spindle Acme Gridley automatic screw machine.

THE YOUNGSTOWN SHEET AND TUBE COMPANY
Manufacturers of Carbon, Alloy and Yoloy Steel
General Offices - Youngstown 1, Ohio
District Sales Offices in Principal Cities

QUALITY YOUNGSTOWN SERVICE

Cold finished bars

BH Bond cuts grinding costs in rough snagging operations

Gardner's new BH Bond gives:

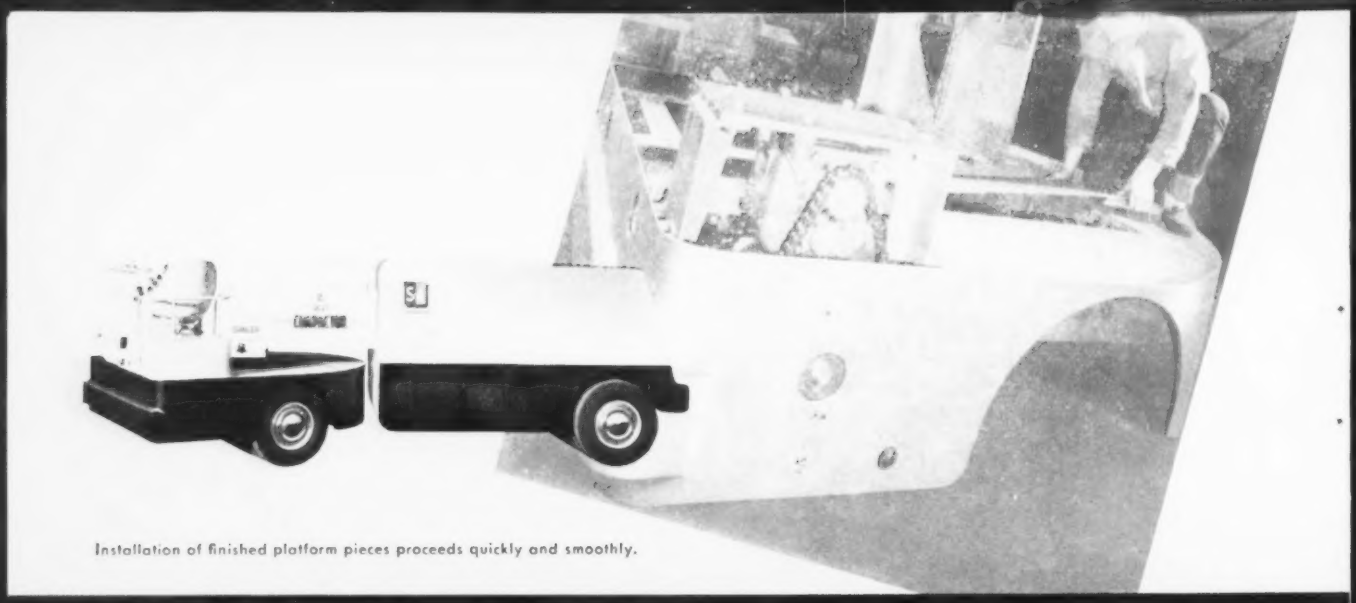
longer disc life
BH Bond is tougher, more heat-resistant

higher production
eliminates frequent disc changing

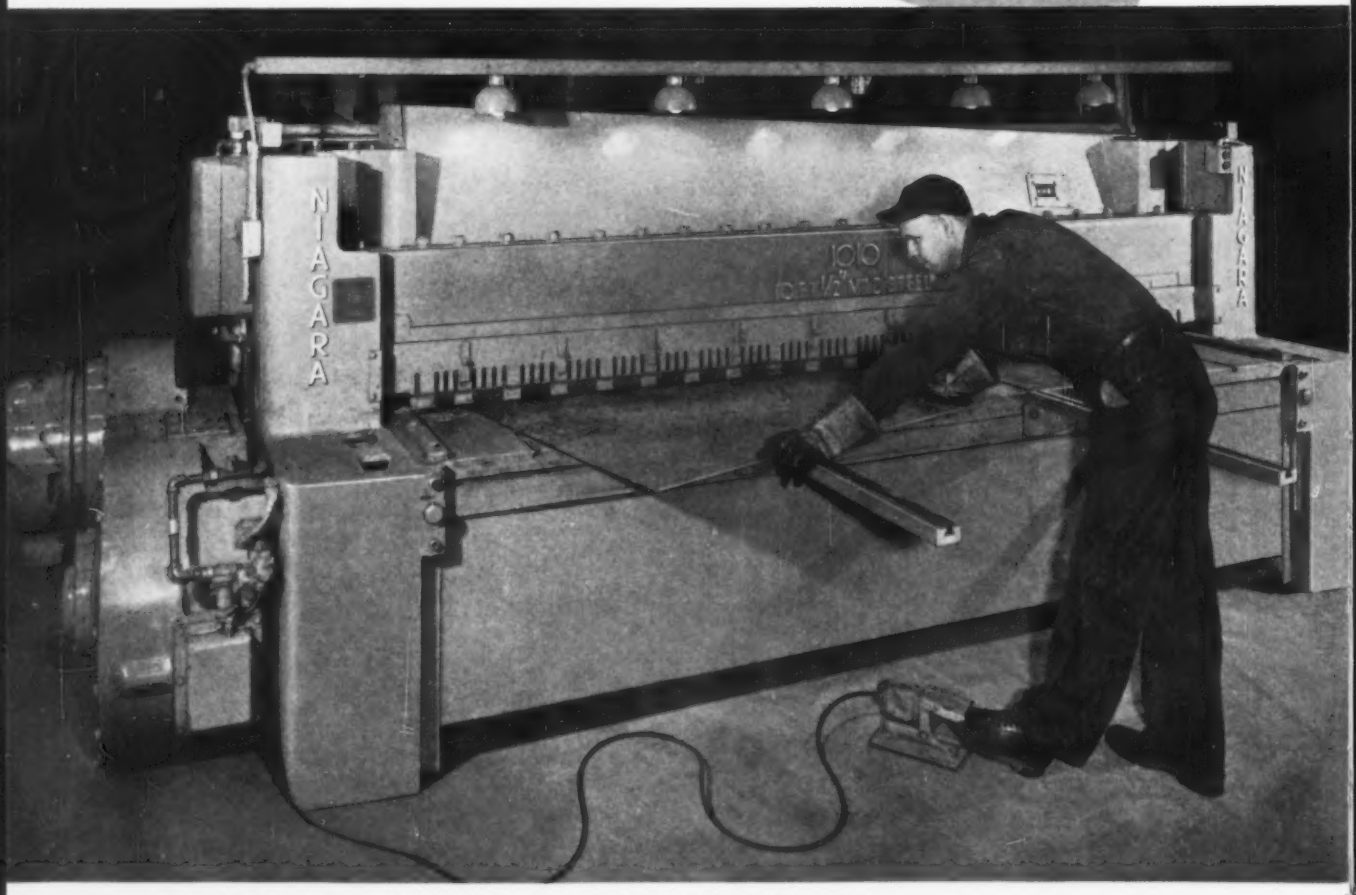
greater efficiency
more production per disc

BH Bond can be supplied in all standard disc sizes

GARDNER
abrasive discs
BELOIT, WISCONSIN



Installation of finished platform pieces proceeds quickly and smoothly.



Niagara Model 1010 shearing 16 gage safety plate for operator's platform of Pneumatic Compactor.

NIAGARA

America's most complete line of presses, press brakes, shears, other machines and tools for plate and sheet metal work

power squaring shears

"high accuracy ...utmost speed"

...sums up Seaman-Andwall's experience with Niagara Power Squaring Shears

Wisconsin manufacturer of road construction machinery uses Niagara Underdrive Power Squaring Shears to assure high quality and peak production.

Hard at work on America's highways, Seaman-Andwall compactors, rollers and other machines are opening the way to faster, safer travel.

Meanwhile, hard at work in the Seaman-Andwall plant, a Niagara Power Squaring Shear is opening the way to faster, more economical production.

"With Niagara's Shear in operation," says Seaman-Andwall, "we are able to cut 3 to 5 tons of steel per day. *The Niagara Shear gives us a high quality of accuracy with the utmost in speed and performance.*"

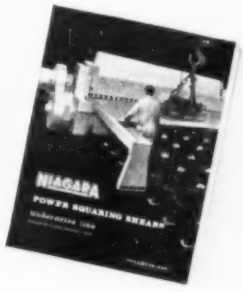
Seaman-Andwall is one of numerous plate and sheet metal fabricators who are making Niagara their choice for power squaring shears. And with good reason!

WHEN IT COMES TO ACCURACY, Niagara's positive, power-actuated self-compensating holddown contacts work with low impact, grips metal securely. Rigid, fully closed box section construction of bed, crosshead, holddown and housings resists all stresses with minimum deflection. Gaging facilities are ultra-accurate. Cutting within micrometer tolerances is assured.

WHEN IT COMES TO SPEED, more working strokes per minute, plus instant engagement of Niagara's exclusive sleeve clutch assure more cuts per hour. There's no need to adjust knife clearance for different thicknesses — holddown feet are self-compensating. Fully visible cutting line, ease of operation and quick-setting gages further boost hourly output.

WHEN IT COMES TO STAMINA, Niagara Shears are built to stand up on the toughest jobs. Simple design and minimum number of parts cut costly repairs. Vital drive components operate in a sealed bath of oil.

LEARN ALL ABOUT NIAGARA SHEARS IN THIS PICTURE-PACKED BULLETIN



See Niagara Shears at work in plants across the nation. Observe every feature, every detail. Learn why Niagara Shears can do the most for you. 74-pages — 141 revealing photographs and illustrations! 19 job photo reports! Specifications for 59 standard models. (Capacities: 16 gage to 1" mild steel. Cutting lengths: 4 to 20 ft.)

USE THIS COUPON FOR YOUR COPY BY RETURN MAIL

NIAGARA MACHINE & TOOL WORKS, BUFFALO 11, N. Y.

Send your new Bulletin 69G on Niagara Underdrive Power Squaring Shears.

NAME _____ TITLE _____

COMPANY _____

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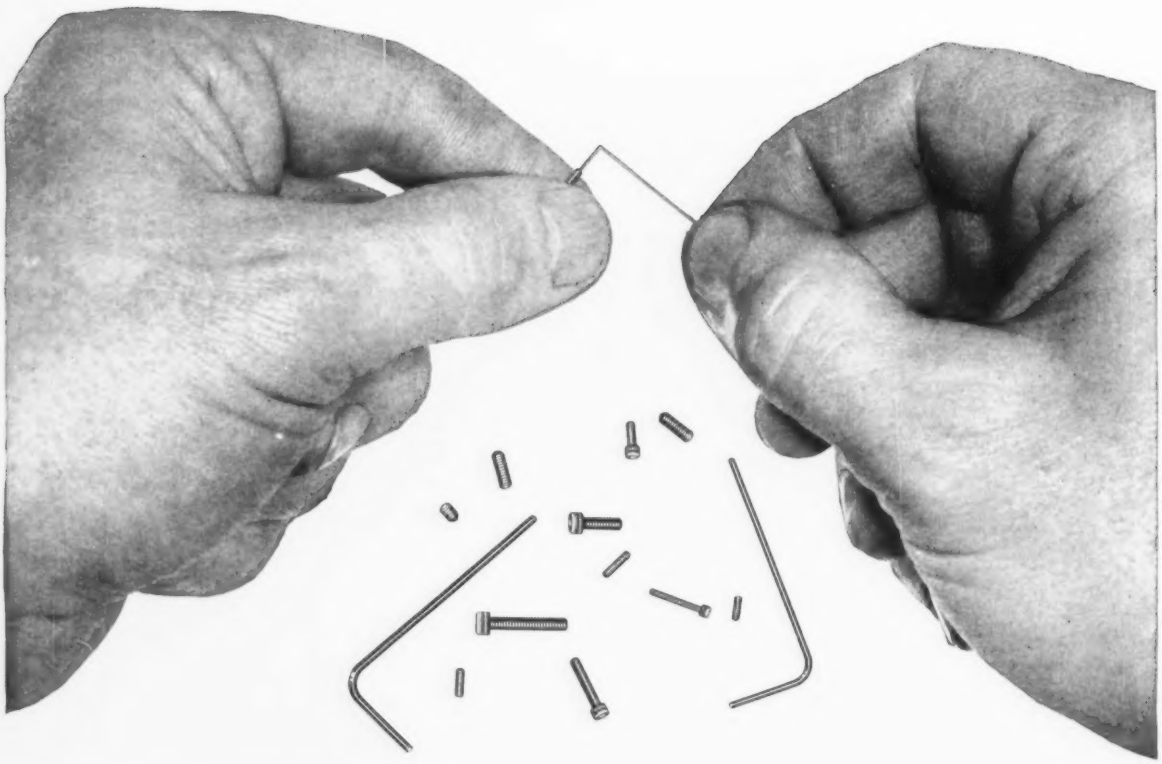
CITY _____ ZONE _____ STATE _____

IA



If you're miniaturizing . . . you'll save space, time and money with Allen Minicaps and Minisets (#0 thru #3 dia.)

These miniature Allen Hex Socket Cap and Set Screws will let you scale down your product sizes even farther. They're made from Allenoy special alloy steel — so strong that you can safely specify fewer screws or smaller sizes.

Allen Minicaps and Minisets are tiny, but very tough! — true Allens, with deep, clean, strong sockets and uniform Class 3A threads. Minicaps have the Allen knurled "Grip-Head" and are trimmed both on top and *under* the head, for tighter fit and better appearance. Minisets have the improved small-cup Allenpoint that drives deeper and holds tighter.

Because sockets are uniformly true hexagon shape, the key or driver fits tight — makes starting much easier, saves a lot of time in assembly.

Diameters of these miniatures run from #0 through #3. Minicap lengths run from $\frac{1}{8}$" through $\frac{1}{2}$", and Miniset lengths from $\frac{1}{16}$" through $\frac{1}{4}$". Also standard in stainless steel. Your Industrial Distributor has them now. He'll show you why these Allens — like all Allens — hold tighter and last longer. Or write for information and samples.

Use Minicaps and Minisets wherever you need dependable fastening in very small assemblies:

TV, radio and telephone equipment • Guided missiles, rockets • Panel meters • Electro-mechanical devices and servo-systems • Computers • Control and operating mechanisms for relays • Cameras • Instruments

Stocked and sold by leading industrial distributors everywhere

ALLEN MANUFACTURING COMPANY
Hartford 2, Connecticut, U.S.A.

ALLEN HEX-SOCKET SCREWS HEAD

UNITED ENGINEERING AND FOUNDRY COMPANY

Pittsburgh, Pa.

Does foul plant air steal part of your profits?

If you're using industrial trucks inside your plant, here's an important fact to consider: air contamination affects your profits as well as your employees' health. It can cost you in many ways—days lost by valuable personnel, reduced employee efficiency, bad employee relations. And it's a kind of waste you can eliminate entirely by using today's modern electric industrial trucks.

Of all types on the market, only *electric* industrial trucks produce no fumes, cause no air contamination. They are the only trucks that you can safely use indoors without ventilation.

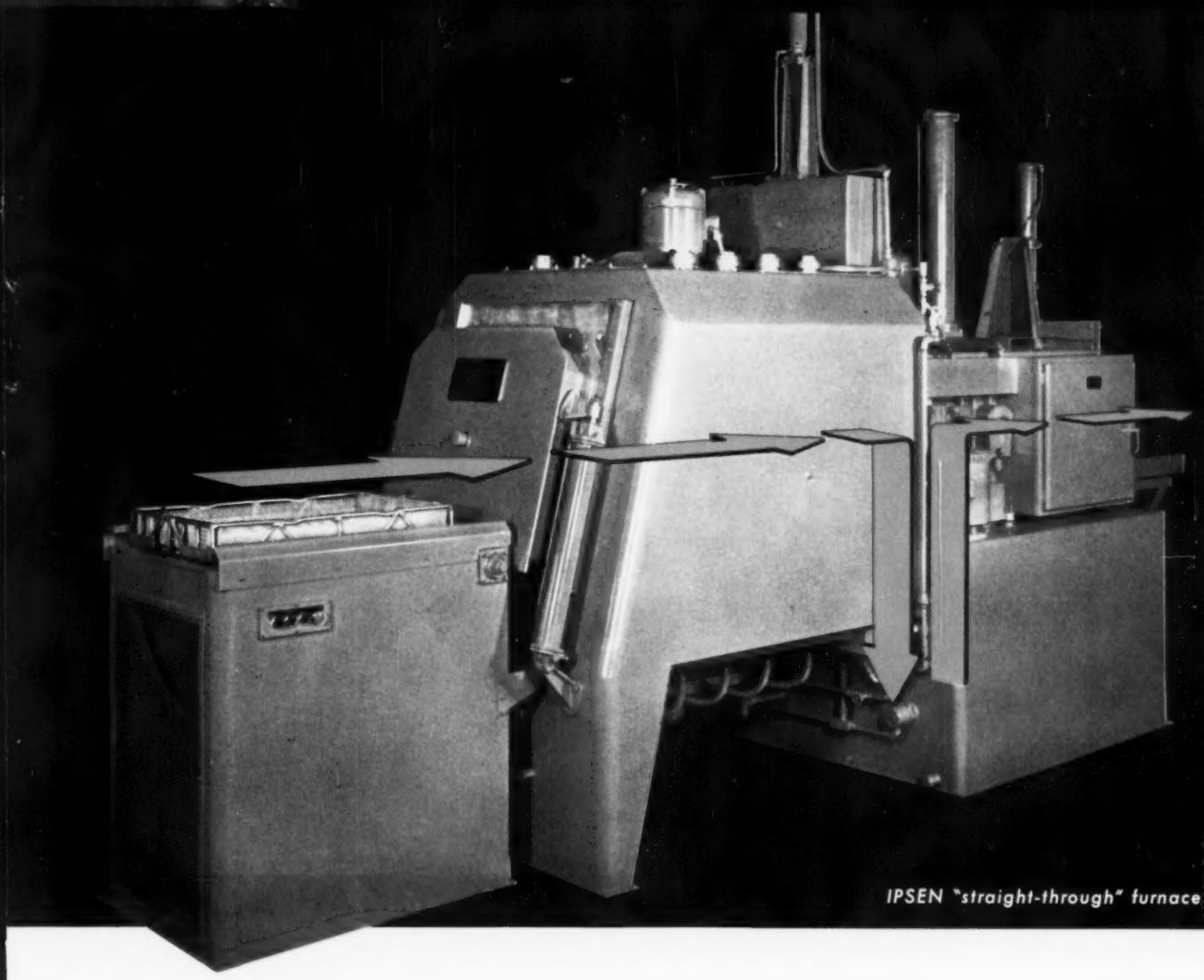
For every industrial truck using liquid fuels, it is calculated that an air change of over 6000 cu. ft. per minute is necessary in order to maintain a minimum safety assurance for employees. Electric industrial trucks save you not only the cost of fans or blowers, but also the cost of additional cooling in the summer to offset heat from internal combustion engines.

Records prove that electric industrial trucks save you money in other ways too: lower operating cost, longer life, reduced upkeep, fewer accidents. Altogether these savings can average as high as $1000 per year for every truck you use.

These are important considerations for up-to-date management men today. Electric industrial trucks are safer, more dependable, and more economical. Have a talk with your nearby industrial truck dealer or salesman. He is listed in your classified telephone directory under "Trucks—industrial."

This message is presented as a service to industry by Exide Industrial Division, The Electric Storage Battery Company, Philadelphia 2, Pa.

THE ELECTRIC STORAGE BATTERY COMPANY **Exide**®



IPSEN "straight-through" furnace

What's your problem . . .

JOB LOT OR PRODUCTION HEAT TREATING?

Here is the furnace that brings in-line production to controlled atmosphere heat treating. In the same basic, compact, heat treating unit, work loads flow with automatic in-line movement from the loading platform . . . through the preheat chamber . . . to the heating chamber . . . into the quench . . . out through the discharge door . . . and then, if desired, on through washing and tempering units.

Total time required for heat treating is substantially reduced, work handling is cut to a minimum, and production costs are reduced.

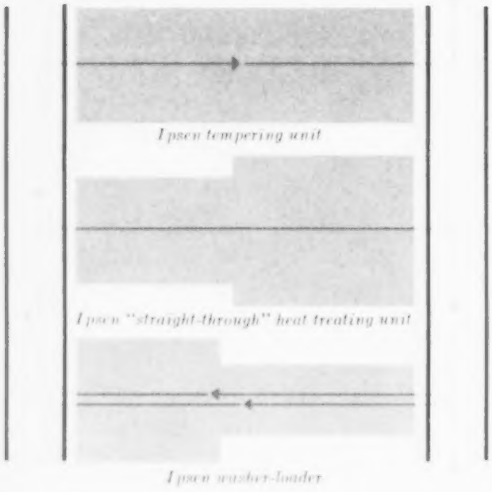
Ipsen "straight-through" heat treating units are suitable for job lot, semiautomatic, or 100% automatic production . . . they're equally efficient as multipurpose units for a wide variety of applications in a heat treating department . . . or for a single heat treating function in an automated production line.

AUTOMATIC Ipsen HEAT TREATING UNITS

following page shows floor plans for both job lot or continuous installations

HERE'S HOW YOU CAN ARRANGE IPSEN "STRAIGHT-THROUGH" FURNACES FOR DIFFERENT PRODUCTION REQUIREMENTS

for job lot production:

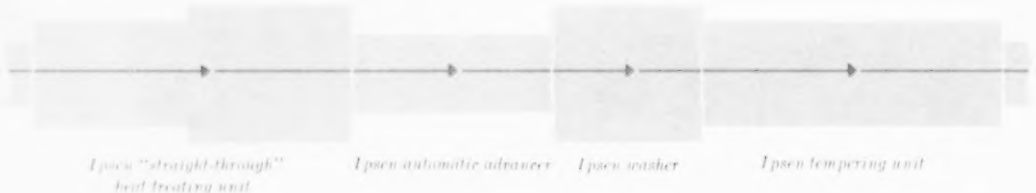


This arrangement includes an Ipsen Washer unit, an automatic "straight-through" heat treating unit, and a tempering unit installed side by side. Two transfer cars operate on crosstracks which connect the three units at both the charge and discharge ends.

Loaded work tray enters the washer . . . emerges from the discharge end to the transfer car which moves the tray to the charging end of the heat treating unit. Tray then enters the work chamber of the heat treating unit . . . passes from the discharge end to the transfer car, then back to and through the washer. The next transfer is into the tempering unit, and the work is ready for the next step of manufacture.

Automatic control of time, temperature, and atmosphere . . . plus the "straight-through" job lot processing features of Ipsen automatic heat treating units offer definite advantages over conventional "in-and-out" job lot type equipment.

for continuous production:



This is a completely automated installation. Special Ipsen-designed mechanisms receive the loaded work trays, move them into the furnace work chamber . . . later transfer them from the discharge end of the heat treating unit to a washer . . . then from the washer to the tempering unit . . . and finally out of the tempering unit to the next processing point.

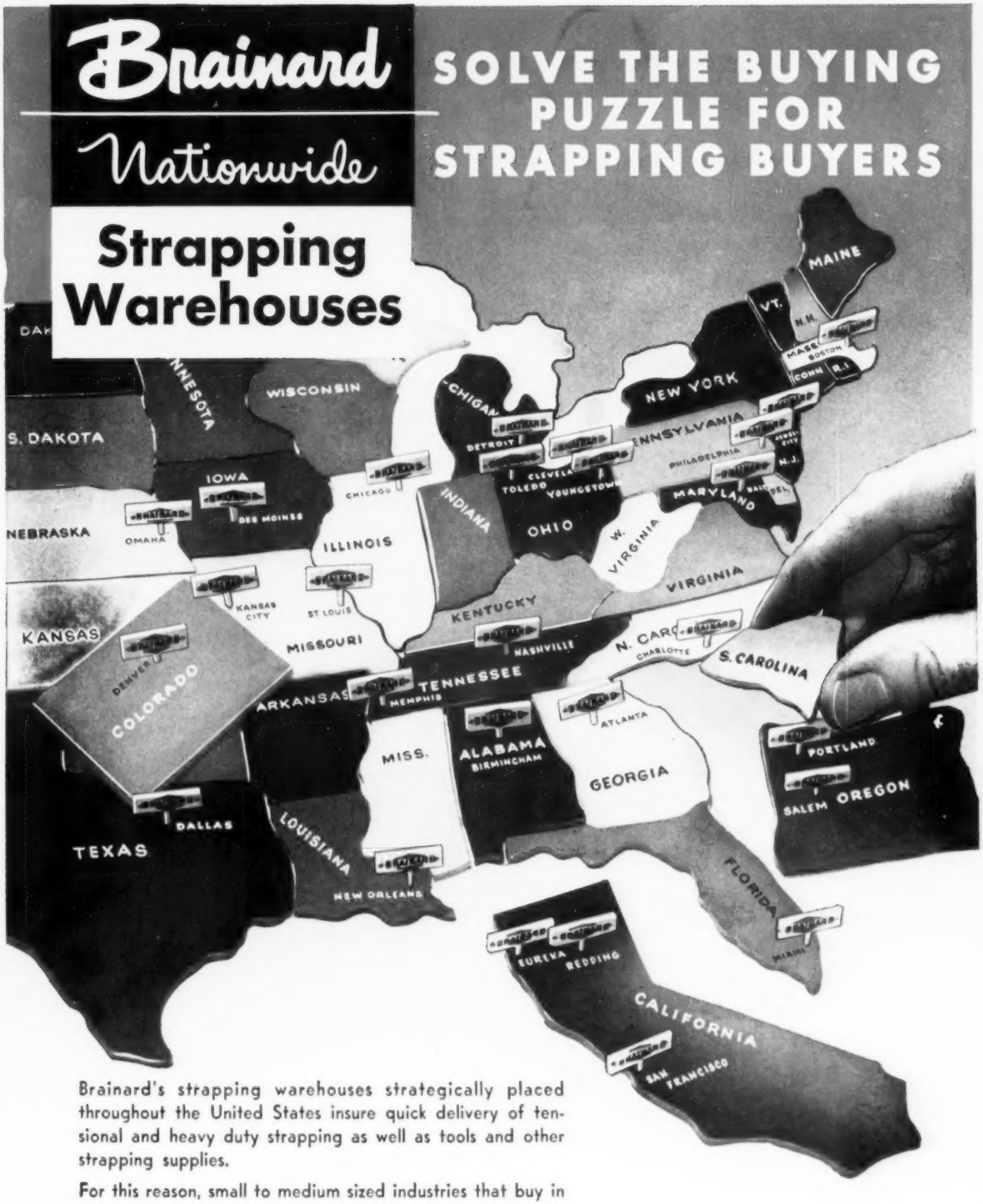
Production flow is 100% automatic . . . continuous and uninterrupted. This type of heat treat line fits directly into an automated production line. Similar "straight-through," automatic, heat treating lines can be installed in straight, L, U, W, or O-shaped arrangements to suit the requirements of your plant.

AUTOMATIC Ipsen HEAT TREATING UNITS

IPSEN INDUSTRIES, INC. 723 S. MAIN STREET ROCKFORD, ILLINOIS

Brainard Nationwide Strapping Warehouses

SOLVE THE BUYING PUZZLE FOR STRAPPING BUYERS



Brainard's strapping warehouses strategically placed throughout the United States insure quick delivery of tensional and heavy duty strapping as well as tools and other strapping supplies.

For this reason, small to medium sized industries that buy in relatively small quantities have found that Brainard's service and delivery are topped only by the quality of their product.

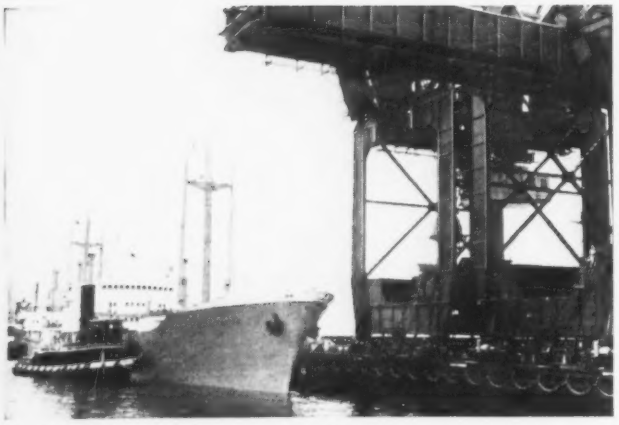
Brainard Steel Strapping

SHARONSTEEL

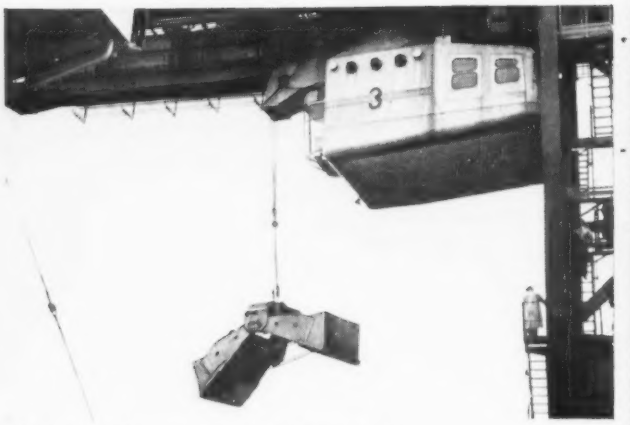
445

Brainard Steel Division, Sharon Steel Corporation
Griswold Street, Warren, Ohio

Faster than a

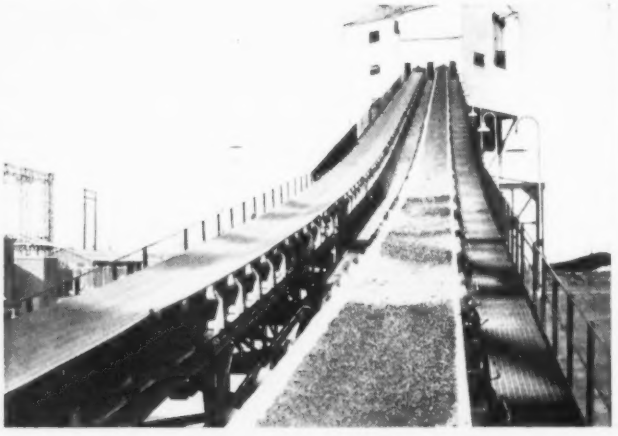


Unloaders handle vessels on both sides of finger-type pier.



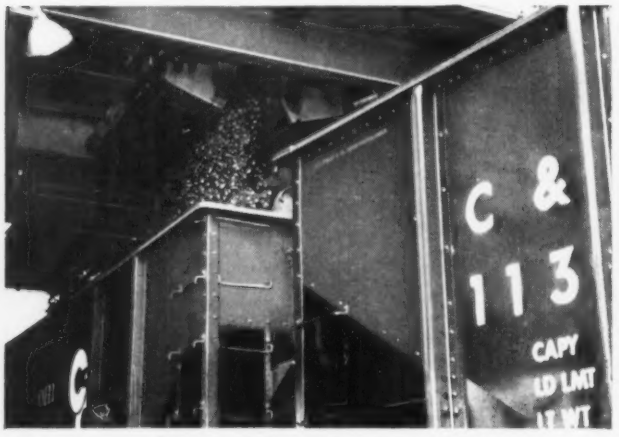
Each unloader can take out 18 tons of ore every 45 seconds.

Each unloader has movable hopper to transfer ore to belt conveyers or direct to railroad cars on pier.



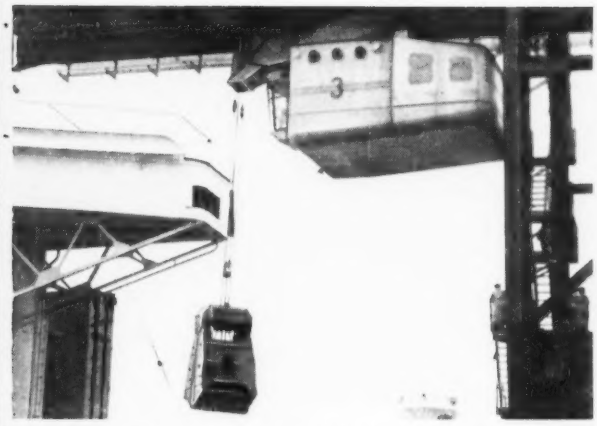
Twin belt conveyers, 48" wide and 1080 feet long move ore at 600 feet a minute to a carloading house.

Electronic weighing, accurate to the pound, is recorded on printed cards.

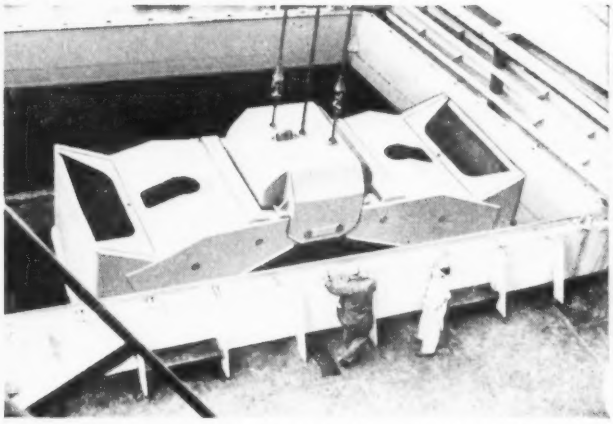


After exact weighing, ore is loaded into thoroughly flushed out cars.

ton a second



Unloaders are "slewing jib" type. 190-ton gondola moves back and forth on trolley and rotates in full circle.



For greater efficiency, light weight buckets use mechanical principle to dig ore on a plane instead of "trenching" back and forth, and clean out holds without auxiliary equipment aboard ship.

Chesapeake and Ohio's new bulk cargo unloading facility at Newport News on Hampton Roads, Virginia, is now giving ore importers and ship operators the finest service on the Atlantic coast. Its 1191-foot pier accommodates the largest ore carriers afloat. Three mobile unloaders, operating with unprecedented flexibility and speed, work two ships simultaneously or three holds of a single large ship and handle two types of ore at the same time. Various sizes of buckets, changeable in less than five minutes, are available for different types of ore and vessel. In a matter of minutes, ore carried on twin belt conveyors is loaded, after electronic weighing, into open top cars for swift Chesapeake and Ohio rail movement inland.

Ship operators like the quick access to the new C&O pier at Newport News and the faster turn-around. Ore importers like C&O's ready car supply and prompt delivery of their cargoes.

* * *

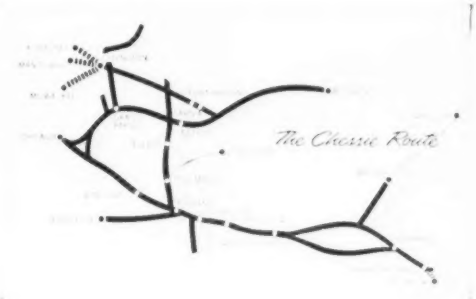
Chesapeake and Ohio's World Commerce Department assists exporters, importers, forwarding agents, steamship operators on all matters relating to rail and ocean shipping of import ores and other overseas and intercoastal cargoes.

Write for illustrated folder showing in detail the operation and advantages of C&O's new bulk cargo unloading facility.

Chesapeake and Ohio Railway

WORLD COMMERCE DEPARTMENT, NEWPORT NEWS, VA.

World Commerce Dept. Offices: New York 7, N. Y., 233 Broadway • Chicago 4, Ill., 327 LaSalle Bldg. • Detroit 26, Mich., 525 Lafayette Bldg. • Richmond 10, Va., 823 East Main St. • Stockholm, Sweden, Kungsgatan 7



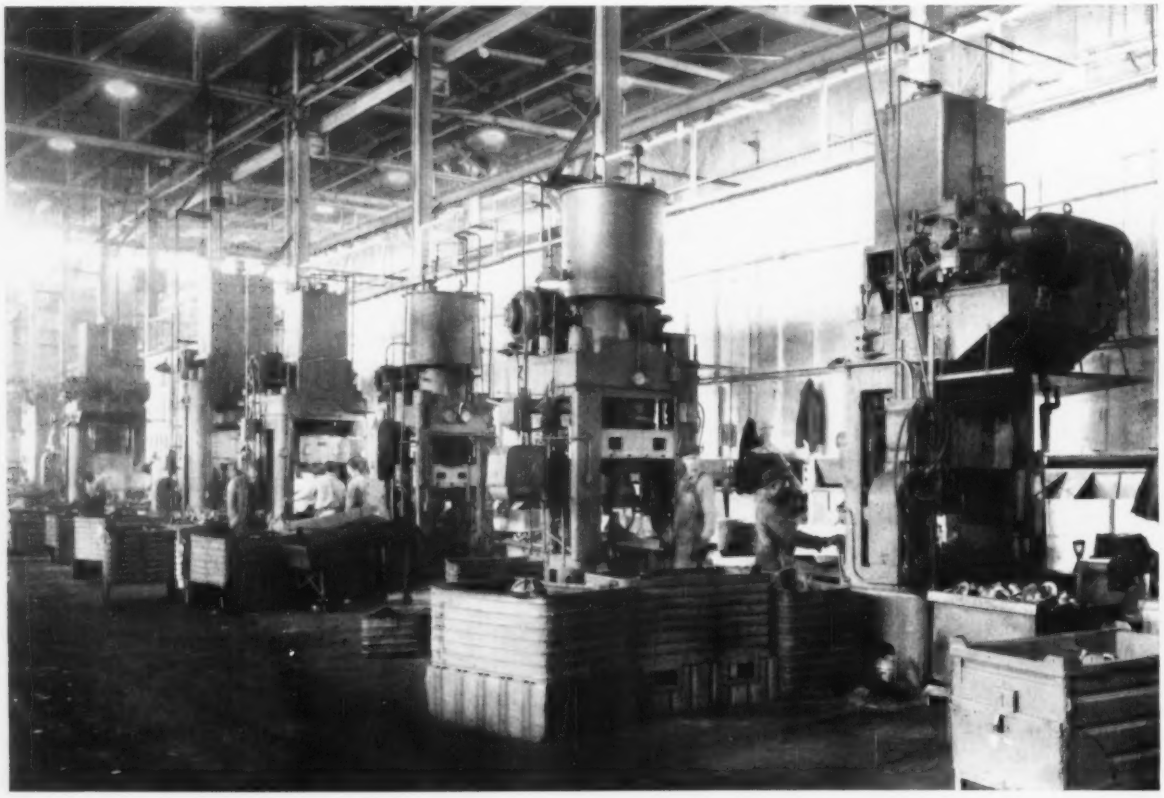
HPM

DIVERSIFIED

TWO EXAMPLES OF THE NEW, BROADENED SCOPE OF METALWORKING PRESSES BY H-P-M

"Maintaining the high quality of Albion Malleable Iron Company castings is a job that has been entrusted to reliable H-P-Ms since 1937. Today, nine H-P-Ms are being utilized and with continuing dependability" . . . according to Mr. James De Vore, Plant Engineer.

Straightening castings calls for the careful application of force so that metal is allowed to flow slowly and without fracture. H-P-M metal straightening presses provide the control and the versatility for all metal forming techniques with ram speed, tonnage, and stroke adjustable instantly for all conditions. . . .



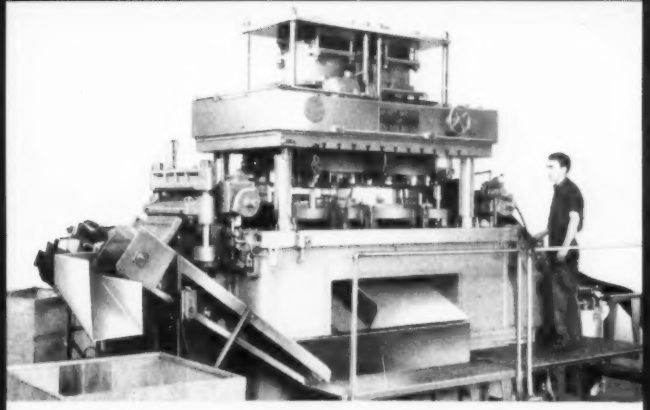
THE HYDRAULIC

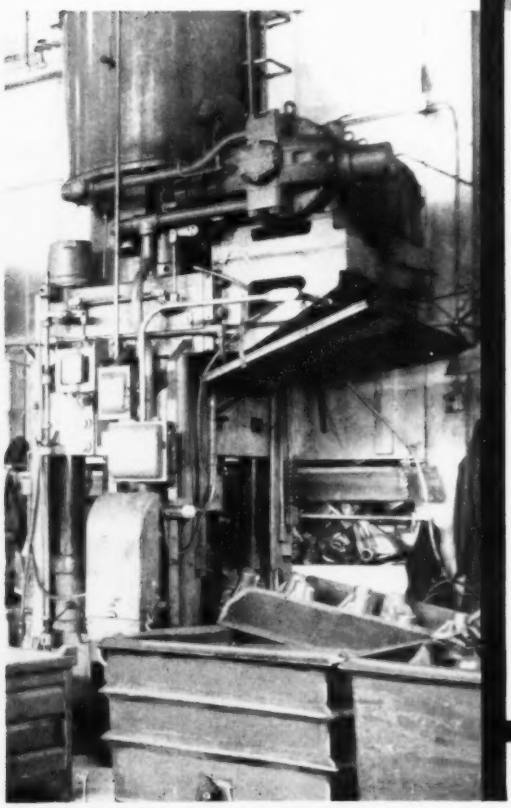
A DIVISION OF KOEHRING

AND DEPENDABLE

. . . Force may be applied to work smoothly and evenly to preadjusted tonnage limitations. H-P-Ms adapt to a multitude of requirements and are generally the busiest presses in the shop. H-P-M can now supply presses for almost every metal processing requirement — from 2 to 25,000 tons.

Send today for complete information . . . ask for Catalog 5600.





Henry and Wright Double Crank *"definitely improved our competitive position"*

Three or four conventional presses would have been required to produce this part, it is estimated by Emil Gaul, vice president of Grand Haven Stamped Products Co., Grand Haven, Michigan. Among the features he likes about the Double Crank are: unequalled flexibility afforded by the large bed area, rapidity of die change, inching control and safety devices.

"Definitely improved our competitive position," is the way Mr. Gaul sums up the performance of his Henry & Wrights. It's another and typical example of the successful use of the H & W Double Crank dieing machine—providing greater accuracy through two-point support of the cross head, lower center of gravity, pulling power instead of pushing, and versatility and set-up features you'll recognize immediately. They can improve productivity and work quality in your plant, too.

Want more information . . . send for our catalog.

Henry and Wright
Built by H-P-M

H803

PRESS MFG. COMPANY

COMPANY • MOUNT GILEAD, OHIO, U.S.A.

"...in boom times or in bad, we have the capacity to fill your orders or we don't take them!"

NEW REPUBLIC CAPACITY NOW PRODUCING AT

BUFFALO, N. Y. – increased bar output

CLEVELAND, OHIO – two new open hearth furnaces
– increased hot and cold rolled sheets

GADSDEN, ALABAMA – two new electric furnaces
– introducing cold rolled sheets, continuous galvanized sheets, corrugated and flat
– increased hot rolled sheets

WARREN, OHIO – two new electric furnaces
– increased cold rolled, silicon and galvanized sheets

CHICAGO, ILLINOIS – increased bars, rods, wire and seamless pipe
– enlarged three electric furnaces

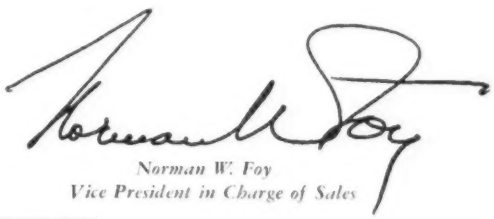
Fair treatment to our customers has been Republic Steel's firm policy over the years.

Through the postwar years, we were under severe pressure to take on new customers in many fields as well as to increase the tonnage of steel to particular categories of steel users. Republic maintained a position of fair, equitable treatment to steel users, with no preference to our own manufacturing divisions. This is a stand of which we are proud.

It has been our aim to build up our capacity so that we could provide more steel tonnage for existing customers as well as take on additional users. We have always considered our assurances of steel to customers to be real assurances, for we had to have the capacity to back up the orders. This is the reason for our substantial expansion program.

Republic's new two million ton expansion completed this month enables us to take on, with complete confidence, additional tonnages from old customers and orders from new customers.

When you place your orders with Republic —from pig iron to special finished steel, or for any of our multitude of fabricated steel products—you know that in boom times or in bad, we have the capacity to fill your orders or we don't take them!



Norman W. Foy
Vice President in Charge of Sales

REPUBLIC STEEL

General Offices • Cleveland 1, Ohio

World's Widest Range of Standard Steels and Steel Products

Alloy, Carbon, Stainless Steels • Titanium • Bars • Plates • Sheets • Strip • Tin Plate • Terne Plate • Cold Finished Steels • Steel and Plastic Pipe • Tubing • Bolts • Nuts • Rivets • Wire • Farm Fence • Nails • Pig Iron • Iron Powder • Coal Chemicals • Fabricated Steel Products • Steel Building Products • Steel and Aluminum Windows • Steel Kitchens • Shipping Containers • Materials Handling Equipment • Drainage Products

Three case histories

How 3 companies improved production by changing to

STANICUT Cutting Oils

Here are reports on three companies that have recorded (1) increases in production (2) better machine performance (3) longer tool life (4) money saved by switching to a STANICUT *Cutting Oil suited to their operations. You can get similar results.*

Standard Oil industrial lubrication specialist, Ray Wells, and Stuart Bergsma, G. A. Brevik manager, inspect carburetor needle valve. Ray recommended plant's switch to STANICUT Oil 137 BCS. He is well qualified to make such recommendations. Ray is a graduate of the Illinois Institute of Technology with a degree in engineering, and he has completed the Standard Oil Sales Engineering School. He has been an industrial lubrication specialist at Standard for six years.

G. A. Brevik Manufacturing Company uses STANICUT Oil 137 BCS

G. A. Brevik Manufacturing Company, Prescott, Michigan, is the largest producer of carburetor needle valves. The company was blending its cutting fluid from four different oils. Still they experienced tool breakage and ring formation on the surface of the stainless steel they were machining. Then one machine was converted to STANICUT Oil 137 BCS to test the oil's suitability for this operation. Soon all machines were converted.

Production increased 25% because of the improved performance of the machine tool. Cutting oil inventories have been reduced from four different oils to one. Tool life has been extended. There is no variation in fluids as there was when four oils were being blended, and there is no messy blending operation.

STANICUT Oil 137 BCS is ideally suited for severe, high speed machining.

A few of the stainless steel parts machined on automatic lathes at G. A. Brevik Manufacturing Company using STANICUT Oil 137 BCS.

STANDARD

Some of the pieces manufactured by Dearborn Centerless Grinding Co. Materials used are stainless steel, Inconel and Nichroloy.

Operator George Laverdiere and Standard Oil lubrication engineer, Leland J. Loomis, examine piece just off Cincinnati centerless grinder. Lee Loomis is another man who knows how to advise on metalworking problems. Lee has had ten years' experience in such work, has an engineering degree from Tri-State College and has graduated from the Standard Oil Company's Sales Engineering School.

Dearborn Centerless Grinding Co. uses STANICUT Oil 126 BCS

Difficult-to-grind stainless steel was the problem at Dearborn Centerless Grinding Company. Wheel loading and wheel break-down were such that soluble type oils weren't satisfactory. For this reason, Dearborn began using STANICUT Oil 126 BCS.

Company management found it secured these six important benefits by changing to STANICUT Oil 126 BCS in grinding operation:

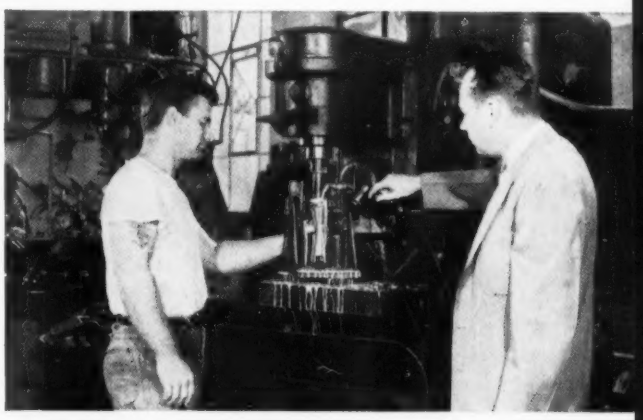
1. Better finishes.
2. More pieces obtained per wheel dress.
3. Superior wheel life obtained on profile jobs.
4. Harder wheels could be used.
5. Finer grit wheels could be used.
6. More stock per pass could be removed.

Woodford Manufacturing Company uses STANICUT Oil 155 CS

This Des Moines manufacturer was drilling and boring a steel wheel fork. Production was at the rate of 45 pieces per hour. Standard Oil lubrication specialist, Jess Nelson, called Woodford plant management's attention to the fact that STANICUT Oil 155 CS was being used successfully elsewhere in the plant. He suggested that much better production and longer tool life would be obtained if STANICUT was used in this operation.

The change, when made, increased production to 78 pieces per hour. Tool life was extended. At the same time, by using STANICUT Oil 155 CS, a 46% reduction in cutting oil costs was achieved.

STANICUT Oil 155 CS is an oil especially formulated for use in machining operations involving tough alloy steels which tend to tear and smear.

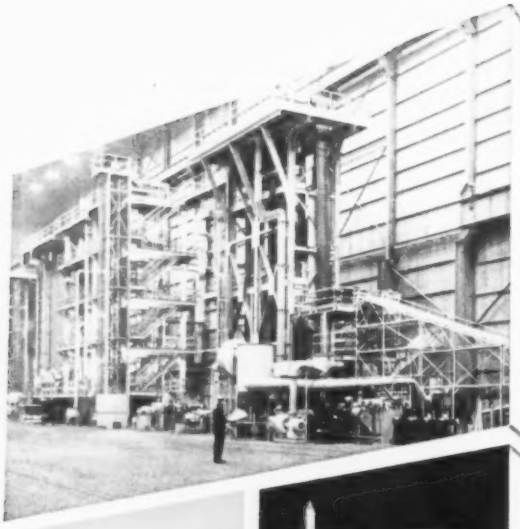


Woodford operator Elmer Light checks piece in Sundstrand Rigidmill while Standard Oil man Jess Nelson adjusts cutting oil flow. Jess, too, knows how to advise manufacturers on metalworking problems. He's had more than four years' experience doing such work. In addition, he has a degree in engineering from the University of Iowa and is a graduate of the Standard Oil Company's Sales Engineering School.

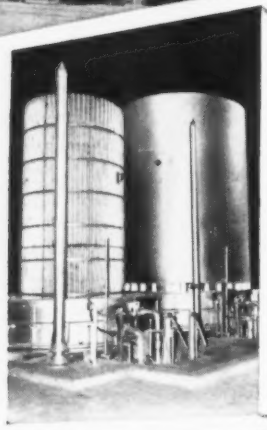
W. B. Noland, Woodford engineer, demonstrates Rollway Dock Plate to Jess Nelson. Parts machined using STANICUT Oil 155 CS are for this unit designed by Noland.

STANDARD OIL COMPANY (Indiana)

Get more data on STANICUT Cutting Oils from your Standard Oil industrial lubrication specialist. One of these men is nearby in any of the 15 Midwest and Rocky Mountain states. Or write Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.



VERTICAL STRIP ANNEALER



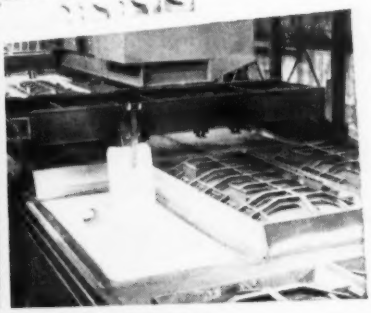
SINGLE-STRIP ANNEALERS

CONTINUOUS STRIP GALVANIZER

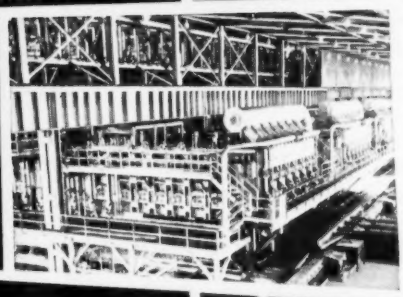
MULTIPLE-STAND ANNEALERS

foundation for steel mill profits

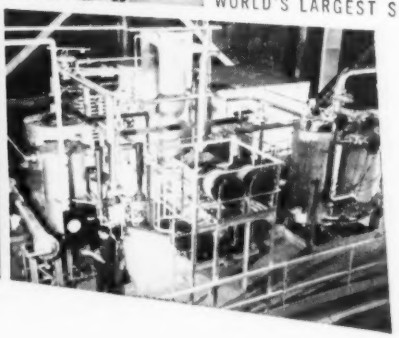
CARBOTTOM COVER FURNACE



ONE-WAY FIRED SOAKING PITS



WORLD'S LARGEST SLAB HEATER



HNX® GAS GENERATOR

You put a solid foundation under your profits whenever you specify Surface equipment. Whatever type it may be, you know it is supported by many interlocked blocks of know-how in heating and handling steel.

The technical skills which Surface has developed in building soaking pits will benefit the man who buys Surface annealing covers. In the same way, Surface concepts of slab heating contribute to high-speed stress relieving . . . carbon restoration to strip annealing . . . controlled atmospheres to wire patenting.

Because of this broad and deep foundation of experience, Surface can improve any single process in the context of a complete sequence of operations. This is to the customer's profit, as many companies will confirm.

Surface Combustion Corporation, 2402 Dorr St., Toledo 1, Ohio. In Canada: Surface Industrial Furnaces, Ltd., Toronto, Ontario.

Surface®

not Just "Another Forged Steel Shaft" .... 93,334 Pounds of Watchmaker's Precision

O.D. 24" finished to 125 micro inches.
O.D. 28.000" bearings 78-¾" long, finished to 32 micro inches tolerance +.000"—.001". Center 40" diameter finished to 125 micro inches.
Large size keyway machined in O.D. at center and each end.
8" diameter bore finished and polished to remove tool marks.

Here is the Main Turbine Shaft for a Hydraulic Turbine Generator to be installed in a power plant near San Francisco.

The shaft started as a 90 inch 240,000 lb. steel ingot. Our quality control men followed it from the open hearth to the forging press, through preliminary turning and boring – and after sonic testing, through heat treating to obtain physical properties in excess of these minimums:

Tensile Strength	95,000# P.S.I.
Yield Point	70,000# P.S.I.
Elongation	20%
Reduction of Area	45%

Close supervision followed through the machining operations where experienced craftsmen reduced the 240,000 lb. ingot to 93,334 lbs. of "Watchmaker's" Precision . . . From raw materials to finished product "Under One Responsibility and One Control". Your steel forging and steel casting requirements will receive the same careful quality control here . . . and your nearest Erie Forge & Steel field engineer will be calling on you soon.

ERIE FORGE & STEEL CORPORATION

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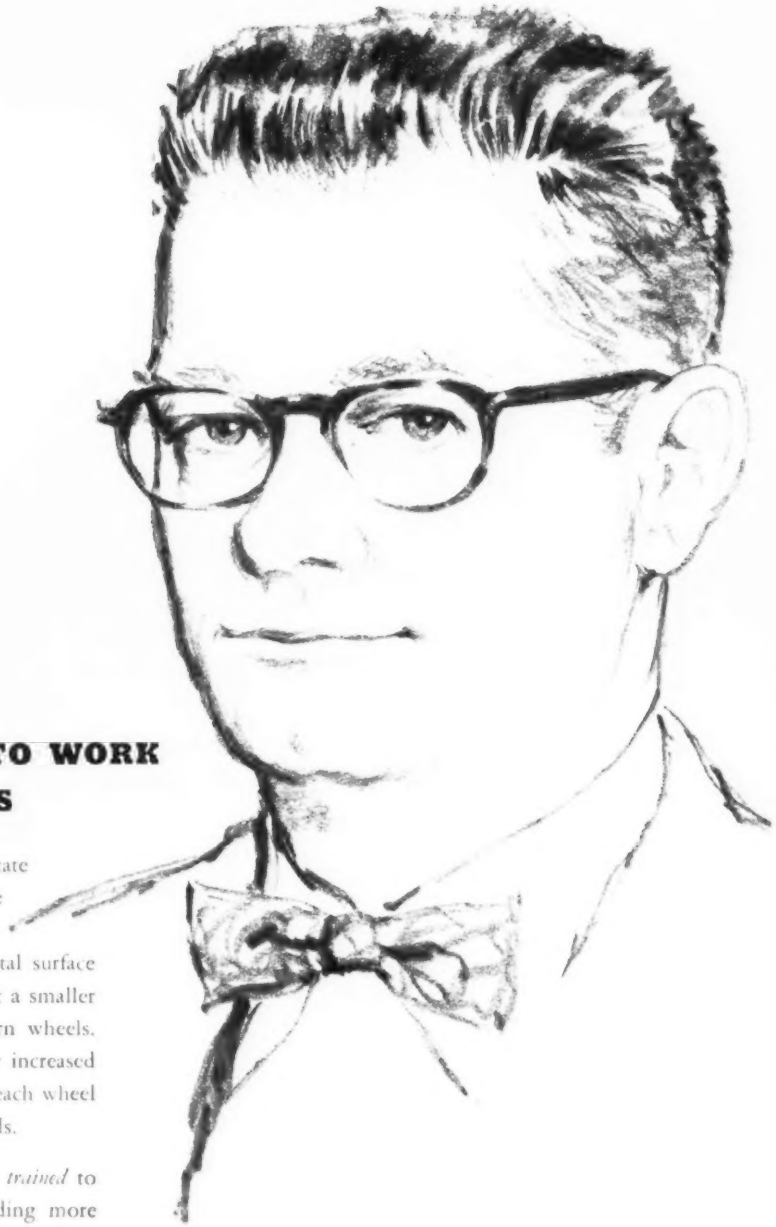

HE PUT ONE WHEEL TO WORK ON TWO MACHINES

At Cleveland's Micro-Plane, Inc., Bay State distributor Jim Lewis saw a way to achieve full-life efficiency for the 24" wheels they were buying for their big horizontal surface grinder. Lewis recommended they adapt a smaller grinder to use the big one's half-worn wheels. Result: wheel productivity substantially increased because ALL of the useful abrasive in each wheel now grinds at optimum operating speeds.

Like Jim Lewis, your Bay State man is *trained* to see practical ways to make your grinding more profitable. **Better grinding at lower cost—that is his business.**

BAY STATE
WHEELS of PROGRESS

BAY STATE ABRASIVES

Bay State Abrasive Products Co., Westboro, Massachusetts.
Branch Offices and Warehouses: Bristol, Conn., Chicago, Cleveland, Detroit, Pittsburgh. In Canada: Bay State Abrasive Products Co. Ltd., Brantford, Ontario. *Distributors:* All principal cities.

There's a HOUGHTO-QUENCH to fit your "S" Curve needs

SPEED... The fastest quench this side of water—if you need it. Or a slower speed oil, if that is required.

New magnetic Quench test, demonstrated at 1957 Metal Show, has proved Houghto-Quench "K" fastest oil on the market today.

SURETY... Uniform quenching results, heat after heat, month after month.

STABILITY... No breakdown, no sludge, no light ends to "crack off," for Houghto-Quench is fortified for stability and long life.

Ask your Houghton Man or write
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. . . a product of

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PHILADELPHIA • CHICAGO • DETROIT • SAN FRANCISCO

Ready to give you on-the-job service . . .

This membership seal means

consistent good quality in PHILLIPS CROSS-RECESSED HEAD SCREWS

Manufacturers of Phillips Cross-Recessed Head Screws who are entitled to the above seal do a good deal more than compete in selling these famous fasteners. They share quality control methods that bring worthwhile advantages to your assembly operations.

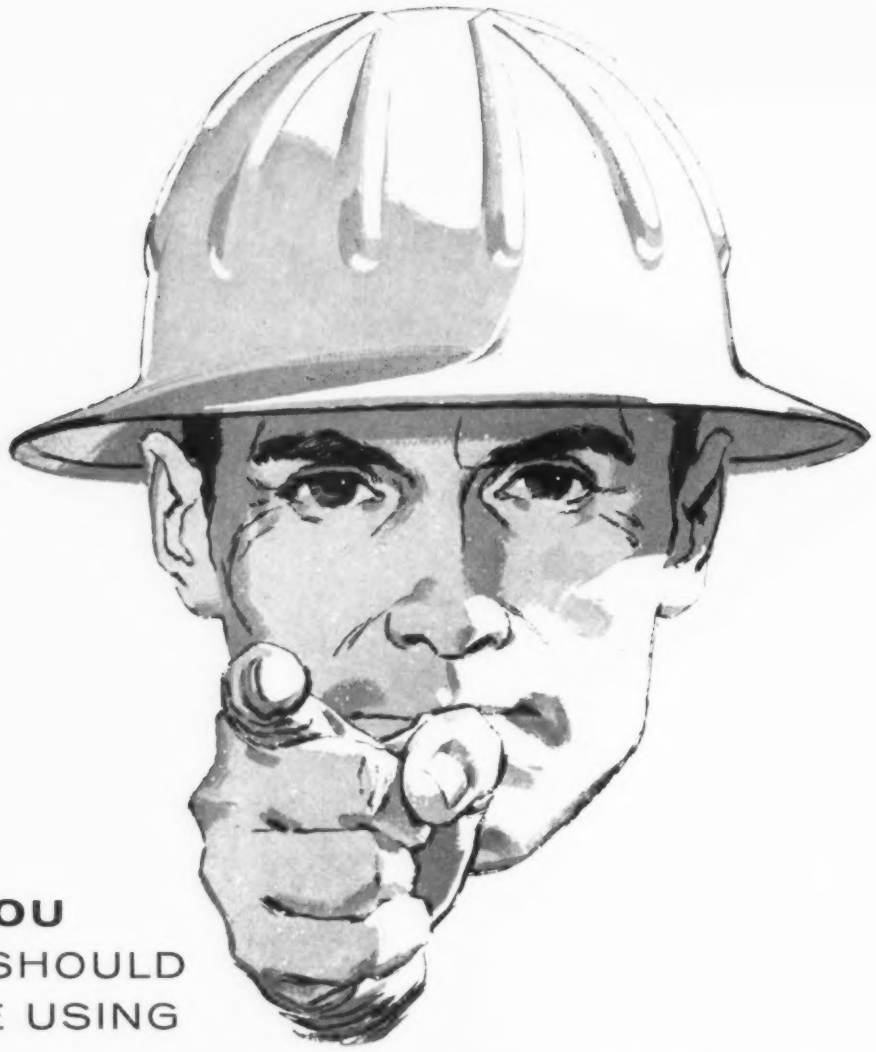
Consistent good quality fasteners for your product from these reliable sources are assured by common adherence to precision accuracy of dimensional standards, inspection gauges and gauging methods established by the Phillips Cross-Recessed Head Standards Committee sponsored by Screw Research Association.

You can rely upon these sources for product reliability which assures correct mating fit between recess and driving point. This eliminates driver slippage and prolongs driver and bit life, improves product appearance and reduces your costs.

Members of Screw Research Association...

You can rely on these sources . . . for product reliability

American Screw Company • Atlantic Screw Works, Inc. • The Blake & Johnson Co. • Central Screw Company • Continental Screw Co. • Elco Tool and Screw Corporation • Great Lakes Screw Corp. • The H. M. Harper Company • The Lamson & Sessions Company • National Lock Company • The National Screw & Manufacturing Company • Parker-Kalon Division, General American Transportation Corporation • Pheoll Manufacturing Co. • The Progressive Manufacturing Company Division, The Torrington Company • Scovill Manufacturing Company • Shakeproof Division Illinois Tool Works • The Southington Hdwe. Mfg. Company Sterling Bolt Company • Universal Screw Company • Wales-Beech Corporation



YOU
SHOULD
BE USING

VANADIUM

HERE'S WHY:

1. **No other alloy is so versatile.**
2. **A *little* vanadium goes a *long* way.**
3. **Vanadium is economical — costs no more than it did 30 years ago.**
4. **It's plentiful!**

Scores of foundries and mills have discovered the real economy and versatility of vanadium. Here are some of vanadium's many uses:

In tool and other steels . . . to reduce and control grain size, to improve and maintain cutting edges. To promote strength, ductility, toughness, wear resistance.

In large forgings . . . for transverse and radial ductility.

In deep-drawing steels . . . to prevent aging.

In the nonferrous field and in chemistry . . . to promote desirable characteristics in the manufacture of aluminum-base and titanium-base alloys, glass, ceramics, inks, coloring agents, synthetic textiles.

Learn more about the advantages and economics of Vancoram Vanadium Products by calling your nearest VCA office!

VANCORAM

VANADIUM CORPORATION OF AMERICA

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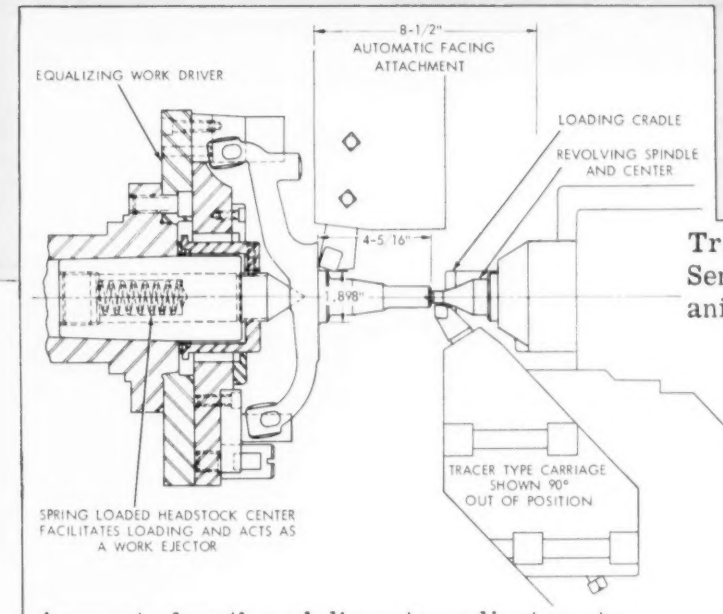
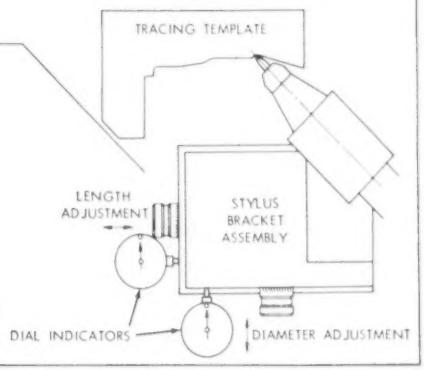
Producers of alloys, metals and chemicals

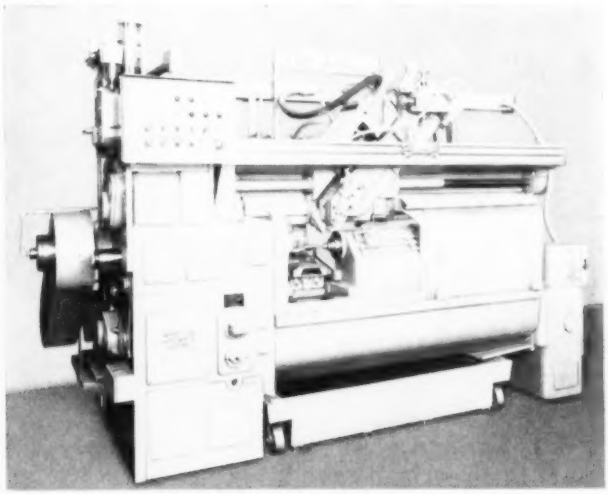
SIMPLIFIED TOOLING CUTS COST OF MACHINING STEERING KNUCKLES ON SENECA FALLS Automatic TRACER LATHE


8-1/2"
AUTOMATIC FACING ATTACHMENT
EQUALIZING WORK DRIVER
LOADING CRADLE
REVOLVING SPINDLE AND CENTER
4-5 16"
1.898"
SPRING LOADED HEADSTOCK CENTER FACILITATES LOADING AND ACTS AS A WORK EJECTOR
TRACER TYPE CARRIAGE SHOWN 90° OUT OF POSITION

Tracer slide operated by Seneca Falls Electro Mechanical Control System.



Accurate length and diameter adjustments are facilitated by two dial gages built into the stylus setting slides.



SENECA FALLS MODEL LQ Automatic TRACER LATHE

Two cutting tools generate the form required. The rear tool removes excess material from the flange face in a coarse-feed, roughing cut. The tracer-controlled tool finish turns both the stem end and flange face. The two carbide inserts may be indexed or rotated to provide new cutting points in a matter of seconds. Tool setting is practically eliminated!

Work handling time and operator fatigue also have been reduced. The operator places the work piece on the spring-loaded head center with the stem end resting on a Vee-shaped loading cradle at the tailstock. The piece is then rotated clockwise until the arm is in contact with a spring stop on the driver. An air valve operating the tailstock quill is then opened, pushing the piece and the head center back against a solid stop and into driving position.

Spindle speed is electronically controlled to provide a constant cutting speed over the stem diameters and the face of the flange—thus assuring maximum production with optimum tool life and finish.

Get the facts on this newest Seneca Falls Lathe.

SENECA FALLS MACHINE

ENGINEERED FOR PROFIT **SENECA FALLS MACHINE CO.**

SENECA FALLS, NEW YORK

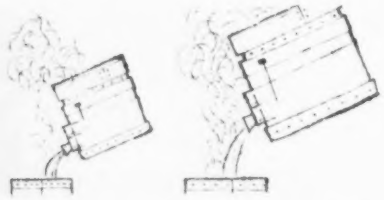
Lo-swing Lathes and Seneca Falls Machine Tools, Automation and Electronics

Carpenter Steel's capacity nearly doubled by adding Bridgeport, Conn. steelmaking facilities

This is Carpenter's vote of confidence in America's expanding economy

Witness with us this major step forward in our program of gearing ourselves to meet industry's growing needs for Carpenter specialty steel!

Production capacity of the Bridgeport facilities adds 84,000 ingot tons to the 86,600 tons rated annual capacity of our Reading plant. This makes available a total annual capacity of 170,600 ingot tons—practically doubling our ability to serve present customers and meet the needs of new customers.



Supported by all of Reading's research facilities and production know-how, the Bridgeport installation is operating under the name of Carpenter Steel of New England, Inc. An experienced Carpenter management and technical task force from Reading is now hard at work putting the plant back into peak operating efficiency. Many former Northeastern Steel Company employees are being trained on the spot in Bridgeport . . . other key employees are undergoing extensive training in our Reading plant.

We fully recognize our continuing obligation to all of our customers—gearing ourselves to render maximum service in a growing economy. Over and above the initial expenditure for purchase of the Bridgeport facilities, we are contemplating an expenditure of up to $6,500,000 to put the plant in proper shape.

Production will be concentrated upon electric furnace quality alloy and stainless steels.

Our purchase of the former Northeastern Steel Corporation will be of direct financial benefit to steel users in New England and the metropolitan New York area. Delivered cost of the kind of steels produced at Bridgeport will be much lower than if the mill discontinued operation.

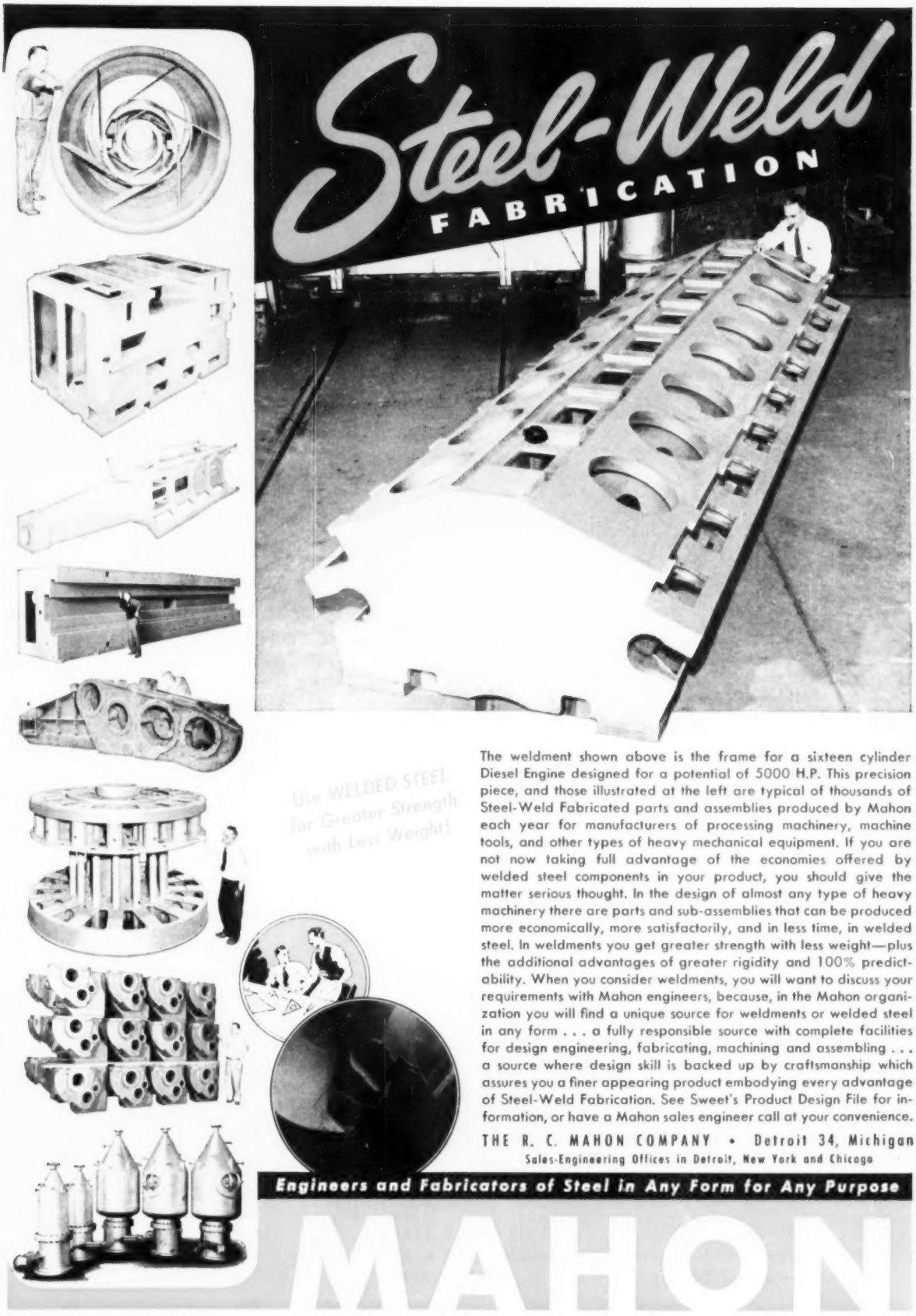
All steels produced at Bridgeport will be sold under the supervision of The Carpenter Steel Company. Former Northeastern salesmen have now completed our regular sales training program and have been reassigned to serve the major market areas for Bridgeport products.

There will be no mass transfer of personnel, equipment or business from Reading. Since Reading has certain facilities that Bridgeport does not have, the expected increase in production at Bridgeport should result in increased employment at Reading.

We make this growth move with confidence—confidence in our loyal friends throughout industry . . . in the skill of our employees . . . and finally, in our role of serving a strong and growing industrial economy.

The Carpenter Steel Company, Main Office and Mills, Reading, Pa.

Alloy Tube Division, Union, N. J.
Carpenter Steel of New England, Inc., Bridgeport, Conn.
Webb Wire Division, New Brunswick, N. J.



The weldment shown above is the frame for a sixteen cylinder Diesel Engine designed for a potential of 5000 H.P. This precision piece, and those illustrated at the left are typical of thousands of Steel-Weld Fabricated parts and assemblies produced by Mahon each year for manufacturers of processing machinery, machine tools, and other types of heavy mechanical equipment. If you are not now taking full advantage of the economies offered by welded steel components in your product, you should give the matter serious thought. In the design of almost any type of heavy machinery there are parts and sub-assemblies that can be produced more economically, more satisfactorily, and in less time, in welded steel. In weldments you get greater strength with less weight—plus the additional advantages of greater rigidity and 100% predictability. When you consider weldments, you will want to discuss your requirements with Mahon engineers, because, in the Mahon organization you will find a unique source for weldments or welded steel in any form . . . a fully responsible source with complete facilities for design engineering, fabricating, machining and assembling . . . a source where design skill is backed up by craftsmanship which assures you a finer appearing product embodying every advantage of Steel-Weld Fabrication. See Sweet's Product Design File for information, or have a Mahon sales engineer call at your convenience.

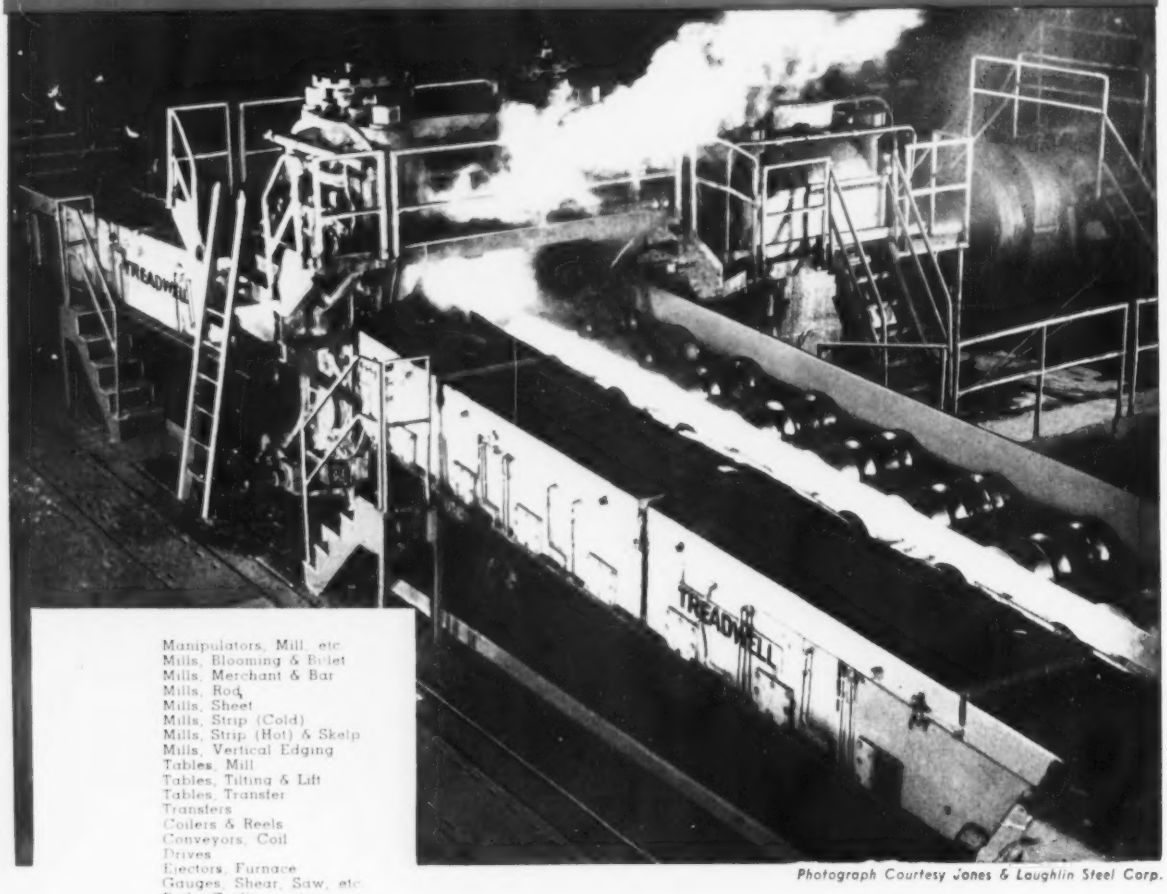
THE R. C. MAHON COMPANY • Detroit 34, Michigan

Sales-Engineering Offices in Detroit, New York and Chicago

Engineers and Fabricators of Steel in Any Form for Any Purpose

MAHON

Treadwell



Photograph Courtesy Jones & Laughlin Steel Corp.

Manipulators, Mill, etc.
Mills, Blooming & Billet
Mills, Merchant & Bar
Mills, Rod
Mills, Sheet
Mills, Strip (Cold)
Mills, Strip (Hot) & Skelp
Mills, Vertical Edging
Tables, Mill
Tables, Tilting & Lift
Tables, Transfer
Transfers
Coilers & Reels
Conveyors, Coil
Drives
Ejectors, Furnace
Gauges, Shear, Saw, etc.
Beds, Cooling
Beds, Inspection
Bumpers, Furnace
Pushers, Furnace
Repeaters
Handling Equipment (Kick offs, Pilers, Cradles, etc.)
Steel and Iron Castings
Ni-Hard and Ductile Iron Castings

40' long 28" three-hi mill tilting tables for diamond and square pass rolling of bars, billets and blooms. Materials automatically manipulated from pass to pass with manipulators. Our Engineers will be glad to discuss your mill problems with you.

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Treadwell Engineering Company

EASTON, PA.

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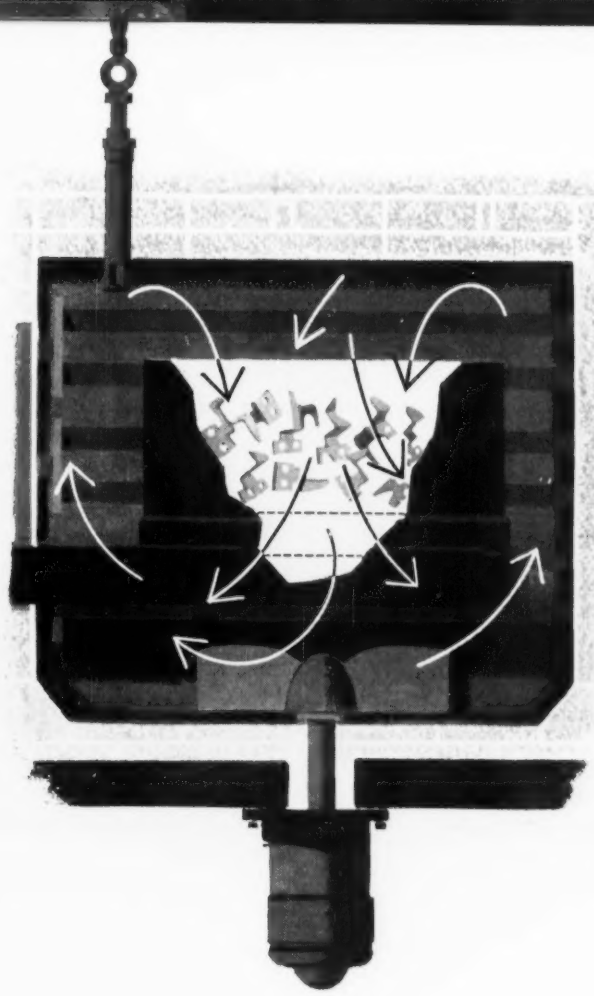


it's new!

The L&N Tricarb method with controlled atmosphere . . . temperature . . . quench

This precision furnace is the most versatile in the history of heat treating. It can be used interchangeably for controlled case carburizing, carbonitriding, homogeneous carburizing, carbon restoration, or hardening.

The unique combination of Microcarb atmosphere control, Speedomax® temperature control and the controlled quench, makes possible significant quality improvements in production heat treating. New, efficient, L-O voltage radiant tube heaters are rugged, requiring minimum maintenance—are not subject to failures from carbon deposits when the furnace is used for carbonitriding without Microcarb control.

In many instances the Tricarb method has proved a practical solution to lower production costs . . . higher quality . . . more process automation . . . elimination of rejects and spoilage. In others it makes thoroughly practical the handling of many previously impossible or difficult heat treatments on a reproducible, production basis.

Folder T-620(17) explains the Tricarb Method. Write us at 4956 Stenton Ave., Phila. 44, Pa.

When small cams for electrical instruments are carburized in this Tricarb furnace, 6¢ per piece is saved on subsequent buffing operations because work comes from the furnace so clean.

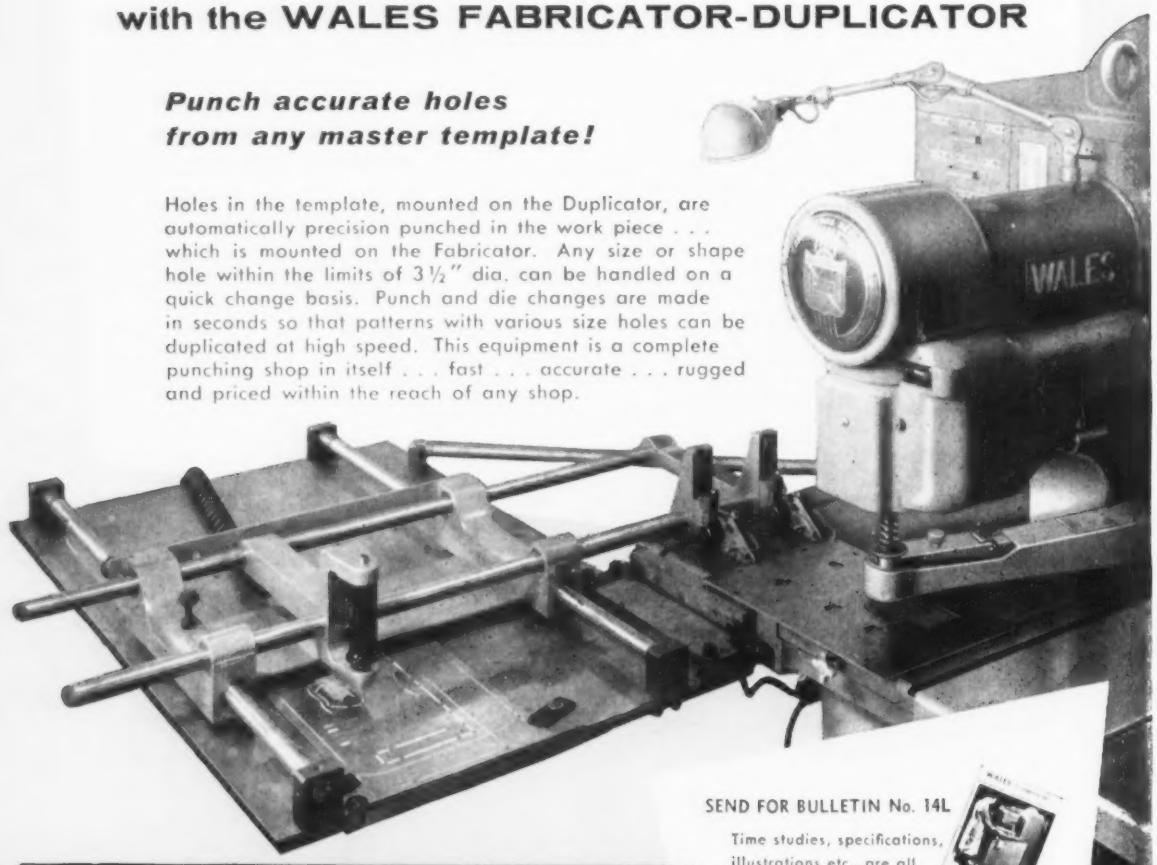
LEEDS NORTHRUP
Instruments Automatic Controls • Furnaces

Duplicate holes Automatically!

with the WALES FABRICATOR-DUPLICATOR

Punch accurate holes from any master template!

Holes in the template, mounted on the Duplicator, are automatically precision punched in the work piece . . . which is mounted on the Fabricator. Any size or shape hole within the limits of 3½" dia. can be handled on a quick change basis. Punch and die changes are made in seconds so that patterns with various size holes can be duplicated at high speed. This equipment is a complete punching shop in itself . . . fast . . . accurate . . . rugged and priced within the reach of any shop.



SEND FOR BULLETIN No. 14L

Time studies, specifications, illustrations etc., are all yours for the asking.

WALES MOBILE FIELD UNITS

We'll bring the Fabricator Duplicator right to your door for a demonstration. Ask for details.

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A UNIT OF HOUDAILLE INDUSTRIES, INC.

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"...the Wales-Way is the PLUS-PROFIT way"

MOLY NEWS

CLIMAX MOLYBDENUM COMPANY, 500 FIFTH AVENUE, NEW YORK 36, N. Y.

Ultra-Strength Steels Boost Tensile Strengths to 300,000 psi.

Ten years ago, engineers considered 180,000-psi tensile strength in steels the maximum they could use safely.

Today, alloy steels with minimum strengths of 220,000 to 300,000 psi are being used commercially. These ultra-strength steels have the ductility and toughness needed for structural applications. At tensile strengths above 220,000 psi, they show more strength per pound of product than high-strength aluminum alloys. And at 260,000 psi, they are approximately 15% lighter than aluminum alloy products of the same strength.

Molybdenum is an essential element in almost all of these steels.

How are the higher strengths and strength weight ratios of these steels being used? Until recently, they've been utilized almost exclusively in aircraft components, such as landing gear. Now, however, they're being considered wherever weight and space savings compensate for higher fabrication costs . . . as, for example, in equipment that must be moved (portable tools); gears, pulleys, belts, liners; heavy machinery operating at high stresses; machinery where inertia is a design factor; materials-handling equipment, such as cranes; and transportation equipment.

Like to know more about ultra-strength steels and their properties, and the names of manufacturers? For our free booklet, circle #1 on the coupon.

Bulletin Shows How to Get Heat Resistance in Cast Iron

In cast iron, heat resistance can mean different things: resistance to growth, to heat checking, to scaling, or to deformation under load at high temperatures.

"Why Moly Iron? #5" contains a chart showing the specific kinds of heat resistance needed by parts such as brake drums, melting pots, piston rings and so on. This chart also lists the best type of iron to use and the proper alloy additions. A number of detailed case histories document this useful bulletin.

For a free copy of "Why Moly Iron? #5" circle #2.

New Coatings May Solve Moly's Oxidation Problem

The most important obstacle to using molybdenum at high temperatures is being overcome. Oxidation is the problem; at temperatures over 1000F, molybdenum oxidizes rapidly.

Newly developed coatings offer molybdenum the needed protection. Three types are promising:

1. Electro-deposited chromium and nickel layers which protect molybdenum to 2000F.

2. Sprayed coatings of aluminum-chromium-silicon alloys, and nickel-boron alloys, which have proved effective at 2000-2400F.

3. Ceramic and molybdenum disilicide coatings which hold promise of protecting molybdenum from oxidation at even higher temperatures.

Digested from "Protecting Molybdenum at High Temperatures" by Julius Harwood, Materials & Methods. For reprint of entire article, circle #3.

Booklet Deals with Molybdenum Joining Techniques

Recent progress in joining molybdenum, and suitable means for protecting it from oxidation, are opening up new uses for molybdenum and its alloys in structural components for high-temperature service.

"A New Look at Joining Molybdenum" by R. R. Freeman and J. Z. Briggs, both of Climax, analyzes the factors involved in joining moly and discusses the methods available.

For the free booklet, circle #4.

List of Moly Literature Now Available

Copies of more than 30 recent pieces of technical literature on molybdenum are available from Climax Molybdenum Company. *For a free list of these, including titles, authors, sources and 25-30 word summaries, just circle #5.*

Steels for Power-Plant, Refinery Equipment at 900-1100F

Designers of power-plant and refinery equipment who need to select steels for applications at 900 to 1100F will be interested in a copy of "Chromium-Molybdenum and Chromium-Molybdenum Vanadium Steels for power-plant and refinery service up to 1100F."

This paper, presented at the ASME annual meeting by George V. Smith, Bard Professor, Cornell University, appraises literature on the subject and draws some new, objective conclusions.

For a free reprint, circle #6.

New Climax Alloy Proves Unusually Wear Resistant

These liner castings, made of Climax 321, proved highly resistant to wear in our ball mill discharge launders. Severe wear normally occurs in this operation as a result of erosion from the coarse pulp flowing out of the ball mill discharge.

If you need a highly wear-resistant material, you may be interested in our new Climax 321 Alloy. It's a hard, martensitic type of white iron containing nickel, chromium and molybdenum in proportions that are well balanced, both metallurgically and economically.

We've been using 321 Alloy in our own mining operations with exceptional results. Comparative tests in ball mill liners and grinding balls proved its excellent wear-resisting properties.

Because this alloy is relatively new, service results in other applications are not yet available. However, our laboratory studies and data indicate it should prove suitable for the general run of abrasion-resistant castings of the martensitic white iron type—such as wear shoes, sand and dredge pump wearing parts, pug mill knives, mixer liners, etc.

Climax 321 can be melted in a cupola or electric furnace and cast in either sand or permanent (chill) molds. It has a normal hardness range of 55 to 62 Rockwell "C".

Composition: Carbon 3.30-3.60%; Silicon 0.30-0.60; Manganese 0.50-0.80; Nickel 2.75-3.25; Chromium 1.75-2.25; Molybdenum 0.70-1.10; Sulphur 0.15 max.; Phosphorus 0.30 max. *For data sheet, circle #7.*

Climax Molybdenum Company, Dept. 2
500 Fifth Avenue, New York 36, N. Y.

I'd like more information on:

1 2 3 4 5 6 7

Name_____

Company_____

Address_____

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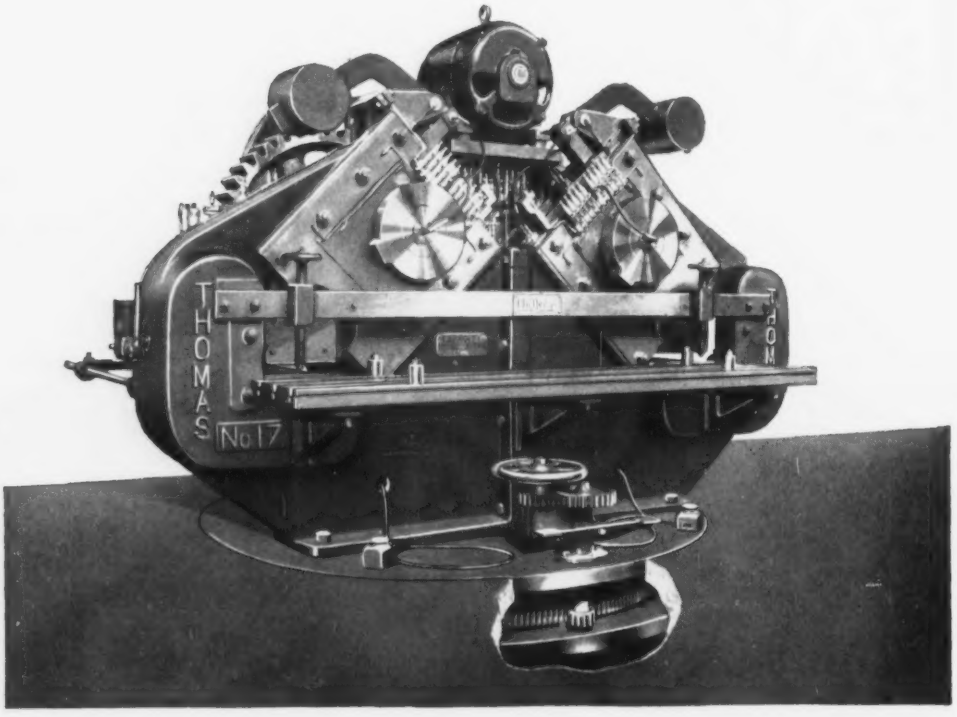
BUYING A DOUBLE ANGLE SHEAR?

If so, it's not the first cost that counts . . . but *the cost per cut*



Thomas Double Angle Shears, like all Thomas Metal-working Machines, are built on the basis of delivering the lowest cost per unit of work.

Thomas does not attempt to design Angle Shears to a price, but builds them to give dependable, fast, economical shearing performance. This assures you a minimum cost per cut and a rapid amortization of initial cost through increased production.

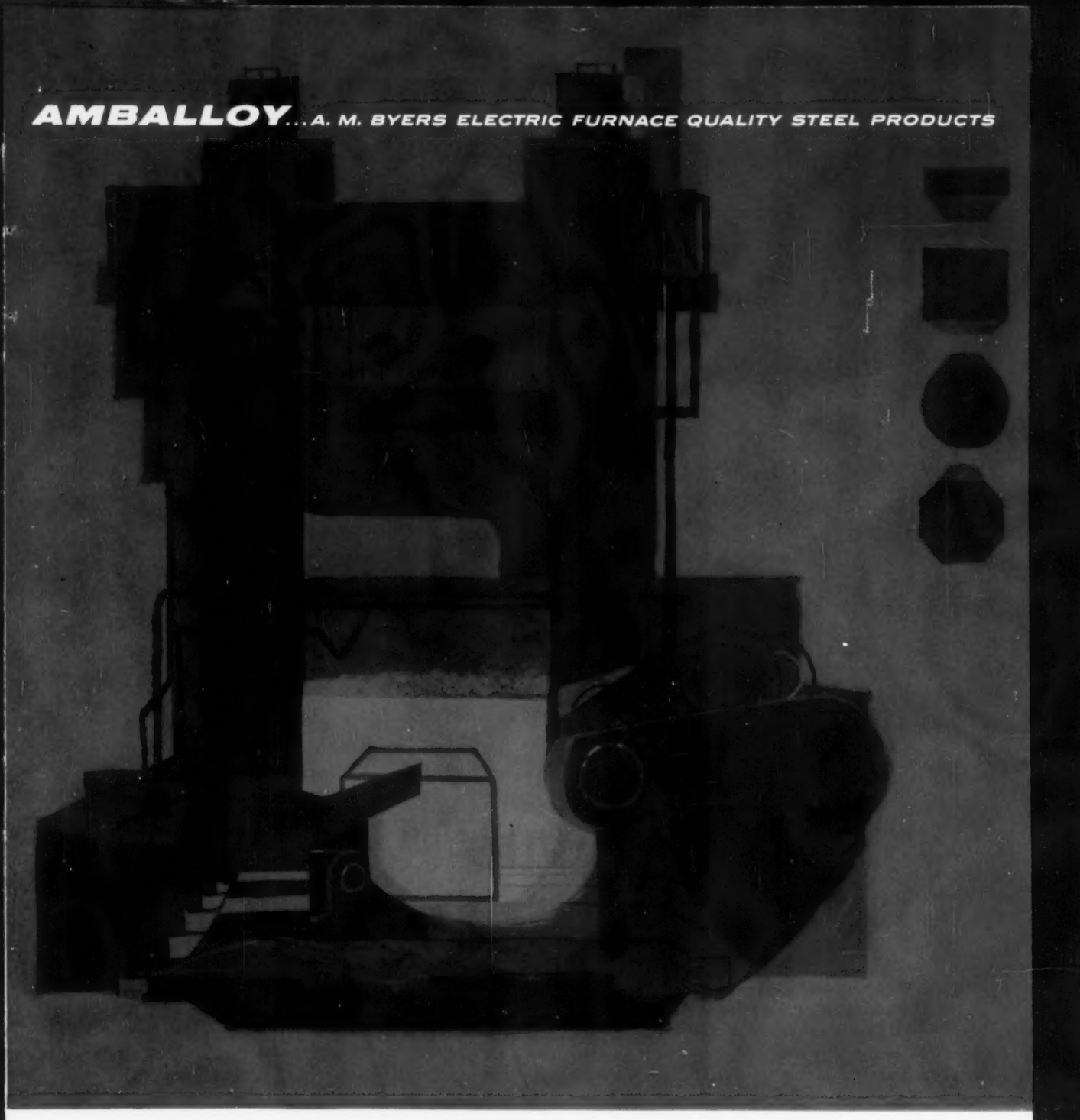
Write for Bulletin 315

THOMAS
MACHINE MANUFACTURING COMPANY
PITTSBURGH 23, PA.

The trend is to THOMAS

70 . . . . . ***in Punches • Shears • Presses • Spacing Tables • Benders***

AMBALLOY...A. M. BYERS ELECTRIC FURNACE QUALITY STEEL PRODUCTS



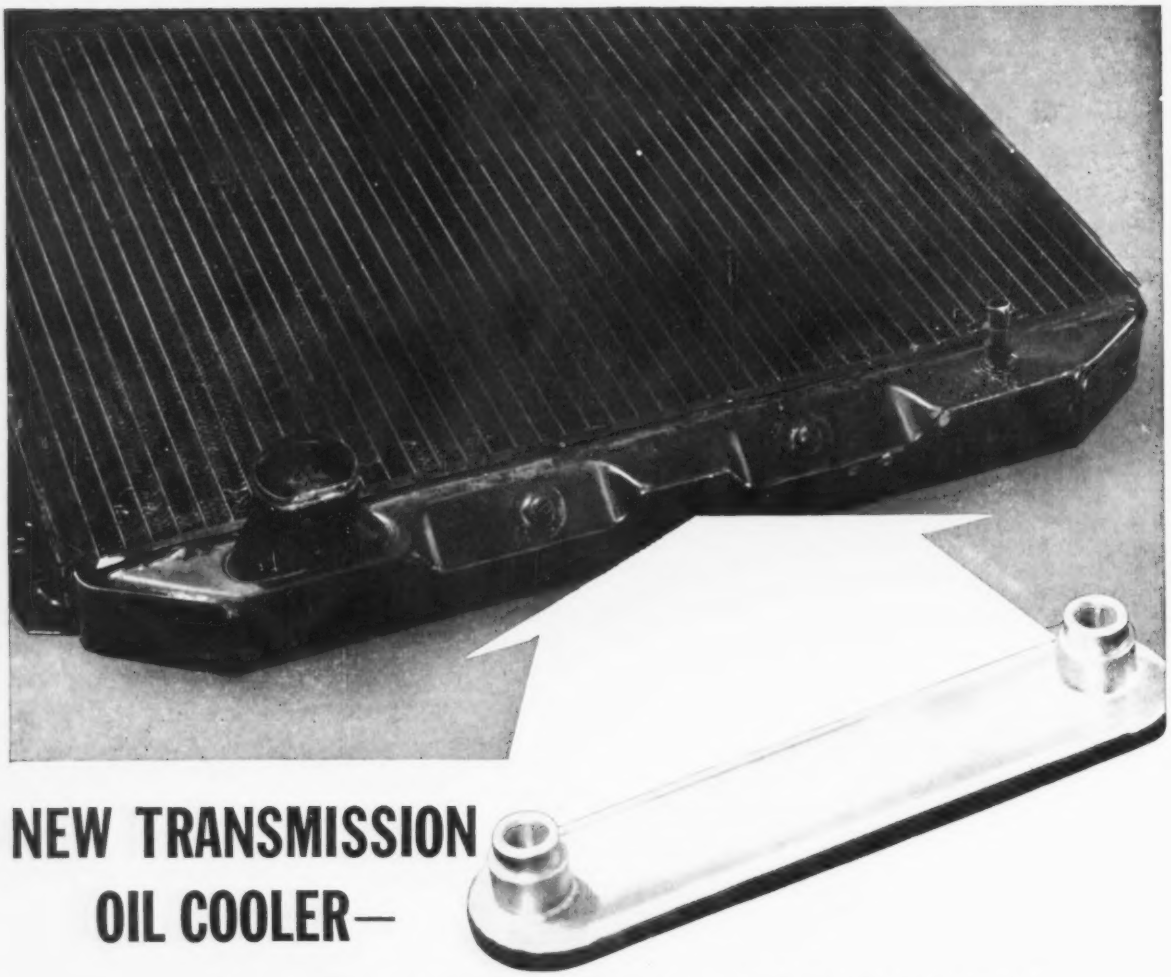
FROM HIGH-GRADE PRODUCTION FACILITIES...BETTER END PRODUCTS

The consistent quality of AMBALLOY specialty steels — stainless, alloy and carbon — is rooted in the exacting quality control of our high-grade production facilities.

We match these facilities with sound furnace practice and skillful melting procedures. Precise control by men of ability and experience assure the quality of each heat. This detailed attention we give to every step of the steel-making process means better end products for users of AMBALLOY.

And to provide you with helpful solutions to your material selection problems, Byers offers a staff of highly trained metallurgists. We can serve you with knowledge and facilities that put your order where you want it, when you want it. Check Byers first. Write or call for details. A. M. Byers Company, Clark Building, Pittsburgh 22, Pa.

A growth company with the emphasis on quality and service **A. M. BYERS COMPANY**



NEW TRANSMISSION OIL COOLER—

another First for ALLEGHENY STAINLESS

Over 70% of today's cars are powered with automatic transmissions. Fine for the motorist, but new problems for the designer. Transmission oils zoom to 300 degrees and must be cooled.

Solution? Mount a small, efficient heat exchanger within the lower tank of the radiator, as shown above. Make it able to stand wide temperature differentials—surrounding cooling water from 0° to 180°; searing oil of 300°. Make it corrosion proof—against all types of water, all varieties of anti-freeze compounds, dirty, hot oil. Since it's tucked inside the radiator, make it strong and maintenance-free.

Allegheny 430 Stainless Steel has proved itself to meet all these design objectives. And it actually reduced unit cost over other materials while still improving performance. The ductility and corrosion resistance of this straight chromium stainless make it a natural for this type of application.

Perhaps *your* product could be improved by a switch to Allegheny 430. It costs less than chromium-nickel stainless grades, it's always readily available, not subject to nickel shortages. To find out how Allegheny 430 Stainless can help you, write for the Technical Bulletin described below or call the Allegheny Ludlum Sales Office nearest you.

Allegheny Ludlum Steel Corporation, Oliver Building, Pittsburgh 22, Pa.

WSW 6782

Write for this 16-page Technical Study that describes alternate selections available for the Chrome-Nickel Stainless Steels. Gives properties, fabrication data, etc.

ADDRESS DEPT. A-961

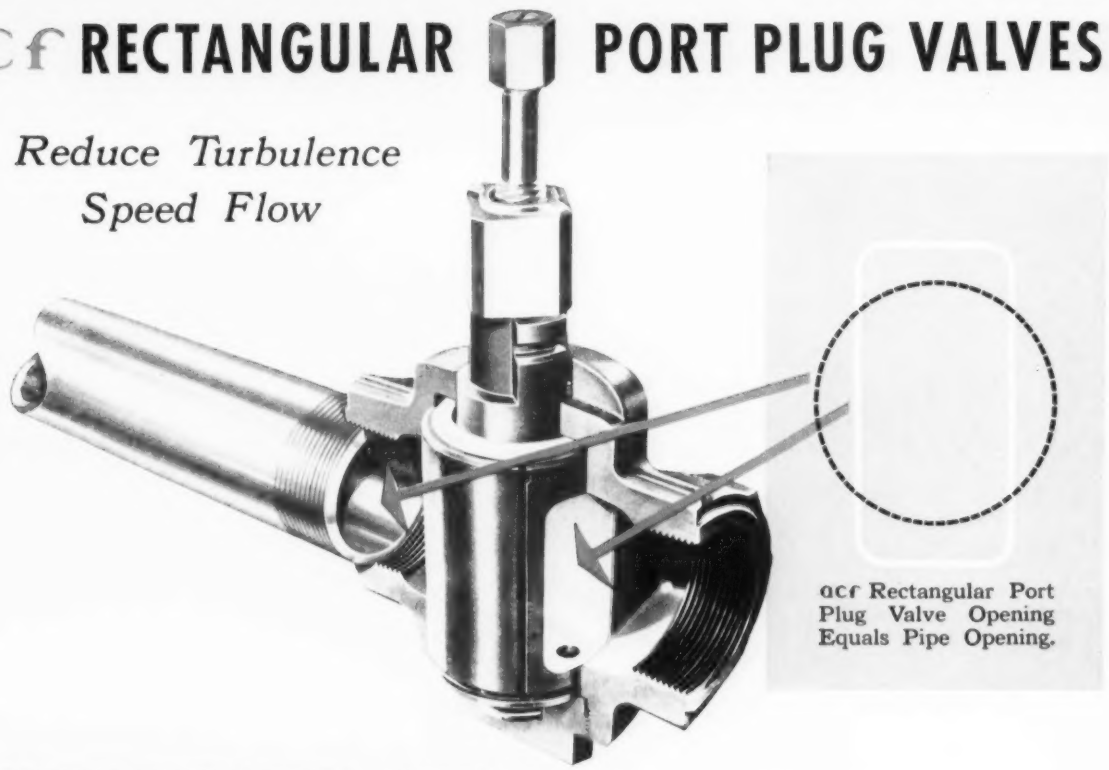
Make it BETTER and LONGER LASTING with

ALLEGHENY STAINLESS

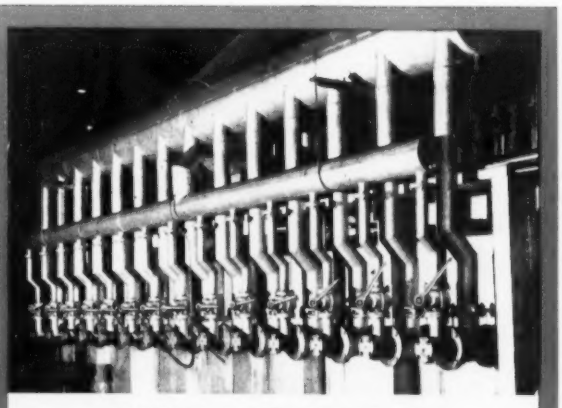
Warehouse stocks carried by all Ryerson steel plants

acf RECTANGULAR PORT PLUG VALVES

Reduce Turbulence
Speed Flow



acf Rectangular Port Plug Valve Opening Equals Pipe Opening.



acf Valves on rod mill gas furnace.

acf Valves in gas reversing and shut-off service on coke oven.

Rectangular ports of acf® Lubricated Plug Valves are sized and shaped to provide the nearest approach to the flow efficiency of the pipe itself and still retain the most compact plug valve design.

In addition, the entrance chamber into the port is designed to permit the flow of fluid from pipe through plug with the least amount of turbulence and loss of head pressure.

Maximum flow efficiency is but one of the advantages you receive when you specify acf Lubricated Plug Valves. Others are: tight sealing without wedging or sticking—Teflon* head gasket—quick, quarter-turn opening and closing—precision lubrication—knife-edge shearing action of the plug. They all add up to low maintenance, long life for the industry's finest lubricated plug valve.

acf Valves are available through your industrial jobber or supply store.

W-K-M
DIVISION OF acf INDUSTRIES INCORPORATED

PLANT: MISSOURI CITY, TEXAS
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*Teflon (tetrafluoroethylene resin) is a registered trademark of acf Industries, Inc.

Complete your file of vital valve data—write Dept. T-1205 for Catalog 400, containing sizes, pressures, specifications, design and performance factors of ACF Valves.

MANUFACTURERS OF W-K-M GATE VALVES acf LUBRICATED PLUG VALVES
KEY-KAST ALLOY STEEL PIPING FITTINGS KEY RETURN BENDS AND FITTINGS
5710

Vibration won't loosen FLEXLOC self-locking nuts

Where products must be reliable . . . must stand up under vibration, temperature extremes and hard use . . . designers specify rugged, reliable, precision-built FLEXLOC self-locking nuts.

HERE'S WHY:

FLEXLOC locknuts are strong: tensile strengths far exceed accepted standards. They are uniform: carefully manufactured to assure accurate, lasting locking action. And they are reusable: repeated removal and replacement, frequent adjustments, even rough screw threads will not affect their locking life.

Standard FLEXLOC self-locking locknuts are available in a wide range of standard sizes, types and materials to meet the most critical locknut requirements. Your local industrial distributor stocks them. Write us for complete catalog and technical data. Flexloc Locknut Division, STANDARD PRESSED STEEL CO., Jenkintown 17, Pa.

We also manufacture precision titanium fasteners. Write for free booklet.

STANDARD PRESSED STEEL CO.

FLEXLOC® LOCKNUT DIVISION

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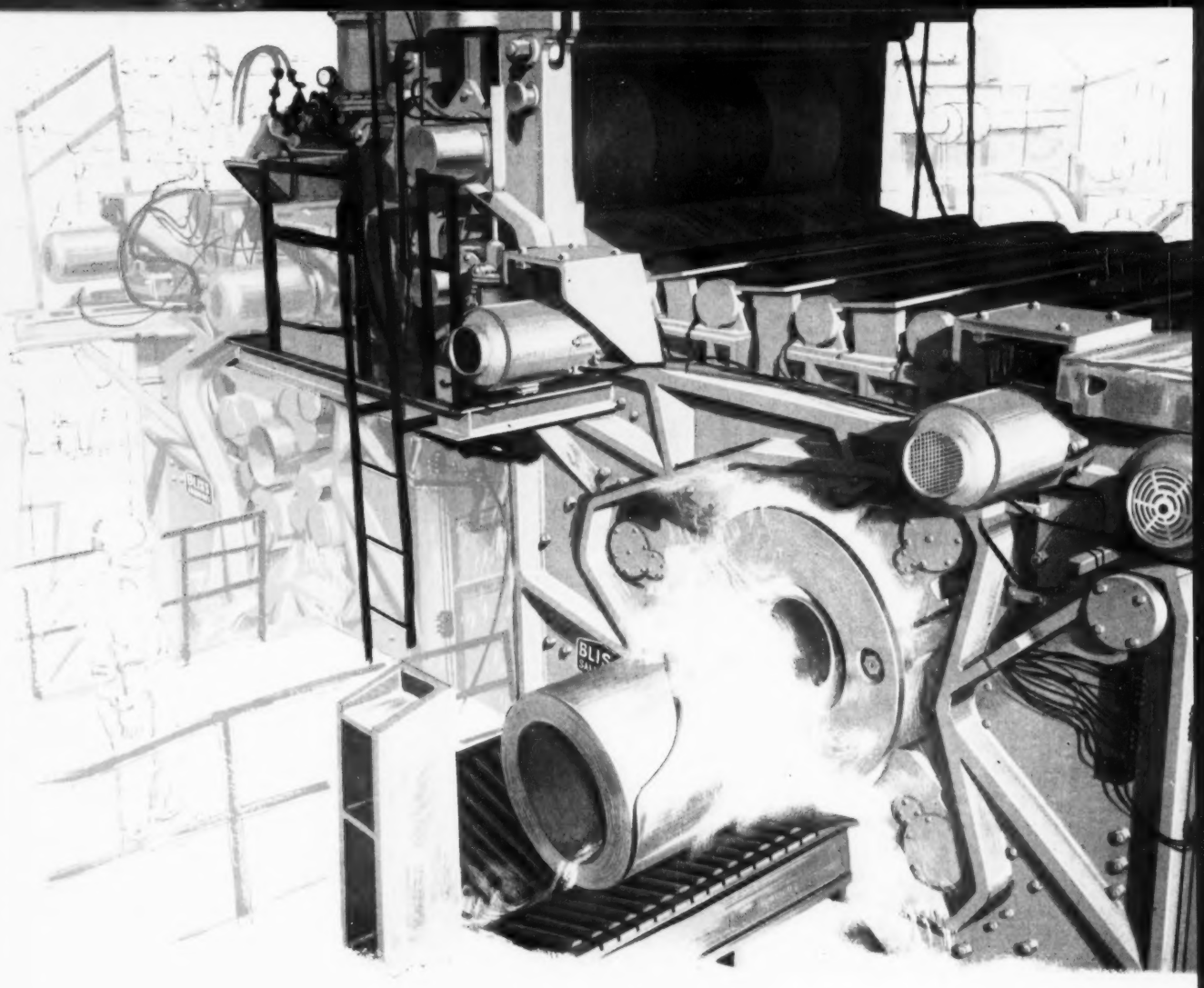


J & L finds a thrifty way to equip a mill with new downcoilers

Not long ago, the 96" hot strip mill at Jones & Laughlin's Pittsburgh Works began to show need for coiler improvements. Bliss Rolling Mill engineers were called in to see what could be done.

After analyzing the situation, they determined that parts of the existing coilers could be retained for use with the Bliss Downcoiler principle. Bliss then performed the task of special design and "field tailoring" to insure improved functional operation.

Today, J & L has the equivalent of a pair of brand new downcoilers, complete with new housings, blocker rolls, stripper mechanisms, roller tables, guides and pinch roll units. The new coilers can handle 30,000-pound coils up to 94" wide.

This particular installation is typical of the Bliss Rolling Mill Division's versatility and open-minded approach to a customer's problem. It's easy to learn more about what they have done and can do... just write us today for a free copy of our 84-page Rolling Mill Brochure, Bulletin 40-B.

BLISS
SINCE 1857 ®

100 years of making metal work for mankind

E. W. BLISS COMPANY, Rolling Mill Division, Salem, Ohio

Subsidiary: The Matteson Equipment Company, Inc., Poland, Ohio

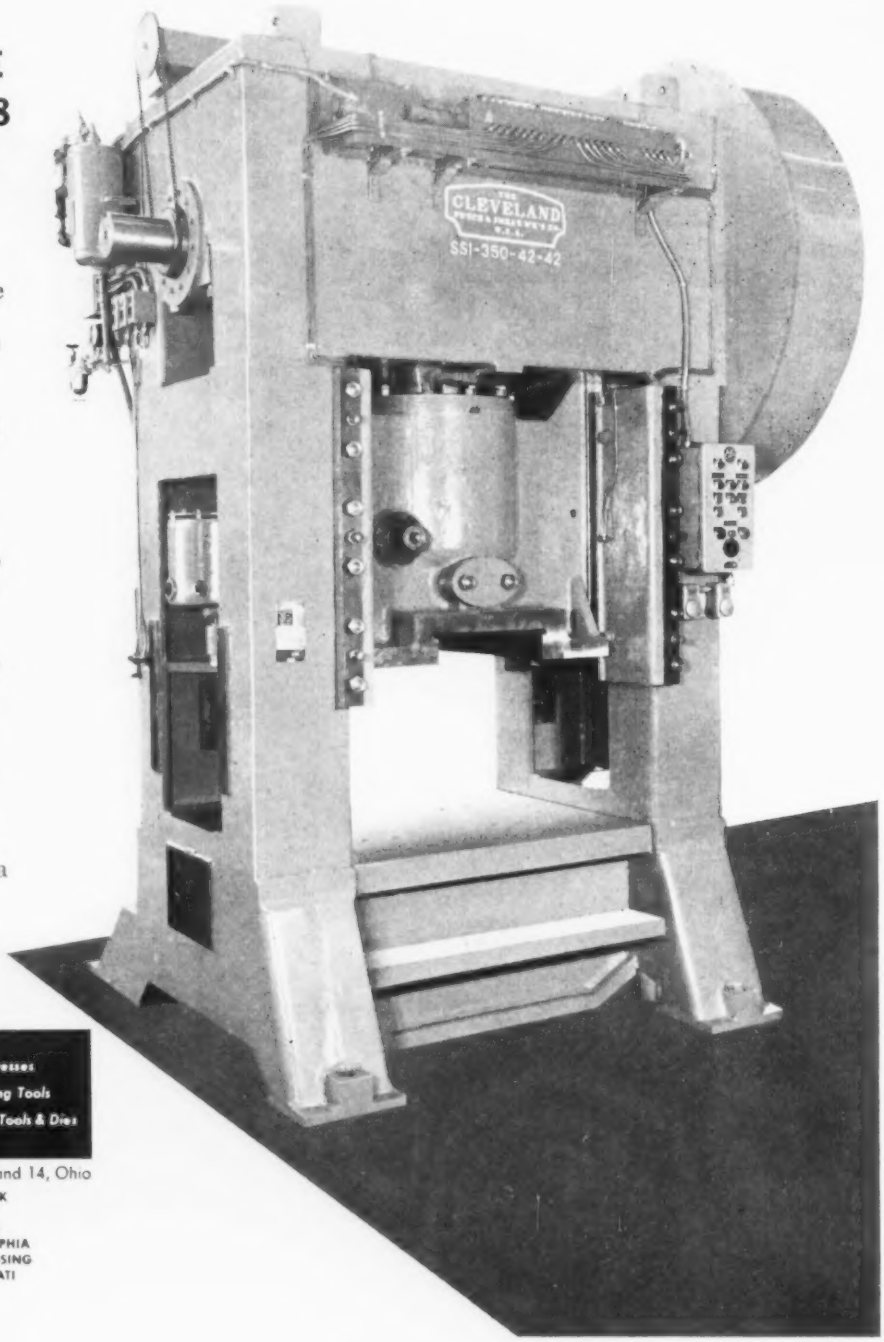
4 OF THESE ECONOMICAL CLEVELAND PRESSES

**newly installed—
now on FULL TIME
production of 1958
automobile parts!**

One of the leading automobile manufacturers recently added *four* of these Cleveland Single Crank Presses to boost production of parts for their 1958 line of cars.

Designed for uninterrupted production with every important cost-reducing and safety feature, these new 350-ton-capacity presses have a stroke of 3″, a shut height of 22″, a bed area of 42 x 42″, and operate at 60 rpm.

If production and economy are your problem, let us send you complete details on the improved performance of Cleveland Presses. You have eleven different types of presses to choose from, each of which can be furnished in a wide range of sizes and capacities to suit your particular requirements.



THE CLEVELAND PUNCH & SHEAR WORKS CO.
Established 1880

Power Presses
Fabricating Tools
Punching Tools & Dies

E. 40th and St. Clair Avenue, Cleveland 14, Ohio

Offices: NEW YORK, DETROIT, CHICAGO, PHILADELPHIA, EAST LANSING, CINCINNATI

AA 6835

Brush wire, crimped (as shown) or straight, now produced in multiple strand, and furnished in coils or straight hanks depending on wire size.

How a **new idea in wire** *cleaned up a brush production problem*

• Maybe you can profit by the kind of interest and action applied to customers' problems by the Worcester Wire Works Division of National-Standard. Take wire brush manufacture for example . . .

Until recently, brush manufacturers had to cut through a coil of wire, then gather by hand and by guesswork the approximate number of wires for the type of brush in production. Naturally this involved a lot of cut-off waste, plus the wire lost through faulty guesswork.

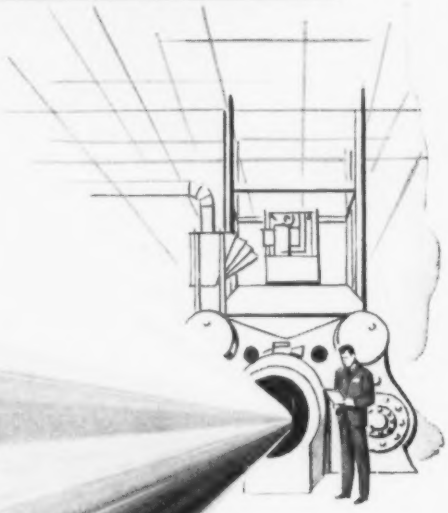
Now, to overcome this waste, Worcester Wire Works has developed ways to produce and furnish wire in predetermined bunches (up to 400 wires per bunch) with *exactly* the right number of wires for a given brush. Much costly loss is eliminated, more brushes are produced per pound of wire, and production is speeded.

The point is, Worcester Wire Works people specialize in more than quality wire. They also specialize in the kind of service and exploration that time and again cuts costs for customers. Better check with them on your wire needs. You'll like the way they do business.

NATIONAL NS NATIONAL-STANDARD Company **STANDARD**

DIVISIONS: NATIONAL-STANDARD, Niles, Mich.; *fine wire, stainless, music spring and plated wires* • **WORCESTER WIRE WORKS**, Worcester, Mass.; *high and low carbon specialty wires*
WAGNER LITHO MACHINERY, Secaucus, N. J.; *metal decorating equipment* • **ATHENIA STEEL**, Clifton, N. J.; *flat, high carbon spring steels* • **REYNOLDS WIRE**, Dixon, Ill.; *industrial wire cloth*

FOR YEARS OF PIPE ECONOMY...



THIS EXTRUDED HEAVY WALL

PROTECTS

against severest heat, pressure and corrosion

Here is High Integrity pipe for the toughest applications in the power, petroleum, chemical and other industries. Extruded from any ferrous alloy in lengths up to 50 feet or more, and with virtually any wall thickness, this pipe from the Curtiss-Wright Metals Processing Division provides increased on-the-job life, long-term economy, elimination of down time – not just for months, but for years to come. Extruded to specification under tremendous one-push pressures from the Division's giant 12,000-ton horizontal steel extrusion press, Curtiss-Wright Heavy Wall Pipe is of uniform high strength and has high resistance to pressure, heat and corrosion. Write today for information on both your standard and special requirements.

72 GRIDER STREET

METALS PROCESSING DIVISION
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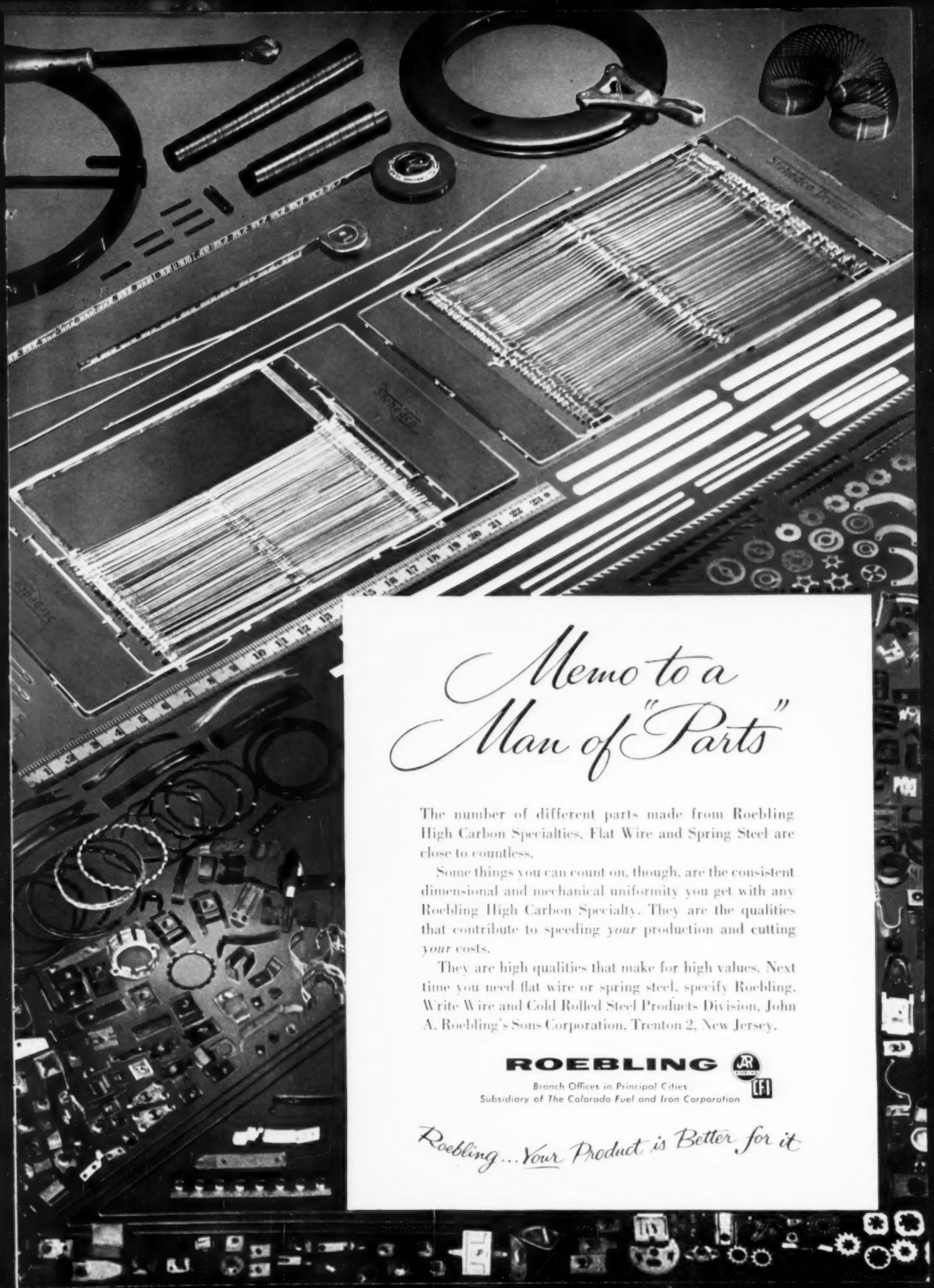


Memo to a Man of "Parts"

The number of different parts made from Roebling High Carbon Specialties, Flat Wire and Spring Steel are close to countless.

Some things you can count on, though, are the consistent dimensional and mechanical uniformity you get with any Roebling High Carbon Specialty. They are the qualities that contribute to speeding *your* production and cutting *your* costs.

They are high qualities that make for high values. Next time you need flat wire or spring steel, specify Roebling. Write Wire and Cold Rolled Steel Products Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

ROEBLING

Branch Offices in Principal Cities
Subsidiary of The Colorado Fuel and Iron Corporation

Roebling... Your Product is Better for it

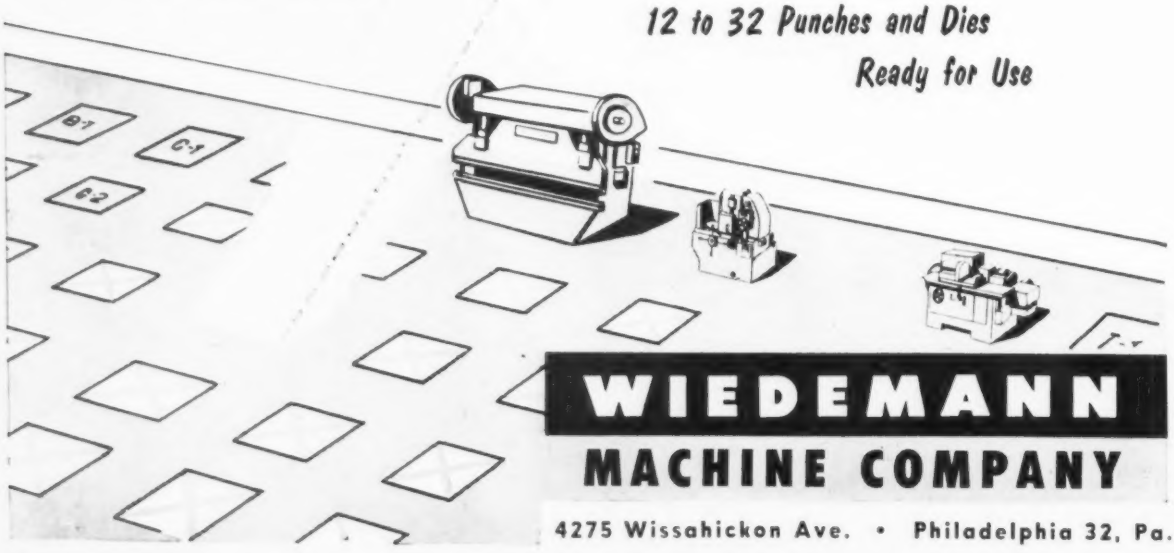
ONE Wiedemann *equals* Plant "Expansion"

Exaggeration? Not if the experience of Wiedemann users is any criterion.

Wiedemann Turret Punch Presses produce more work in less time and in less space. In numerous plants, one Wiedemann has replaced as many as 12 or 14 units such as single purpose punch presses, layout tables, nibbling machines, etc. And in most cases, the single Wiedemann, in 1/10 the floor space, actually out-produces the multiplicity of conventional equipment. Direct savings of 60% to 90% are commonplace. Machine down-time is practically eliminated; accuracy is improved; valuable floor space is freed; engineering changes become low cost operations. . . .

If you are interested in greater productivity of pierced parts in small to semi-production quantities, such as panels, chassis, truck parts, etc., it will pay you to get the facts about Wiedemann Turret Punch Presses. Send drawings of your work for time study or write for Bulletin 201.

12 to 32 Punches and Dies Ready for Use

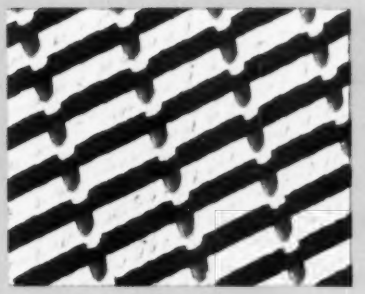


WIEDEMANN MACHINE COMPANY

4275 Wissahickon Ave. • Philadelphia 32, Pa.

They're all the same to MAGICUT

NICHOLSON'S NEW ALL-PURPOSE MACHINIST'S FILE



If you haven't tried the new Magicut, you've missed a very unusual new file. It's a Machinist's file—with a brand new kind of teeth. The teeth are Penetrating Planer-Type. They're created by using steep-angled serrations to get lots of narrow chip breakers.

Magicut is super-efficient. It works its magic on whatever industrial metals you use—cuts quickly by biting into the material being filed then leaves a smooth finish. Stock removal and smoothing are made easy with the new Magicut. It roughs and smooths—*in one operation*. You can get this fine new file in Flat, Half Round and Square shapes in sizes shown at right.

Ask your Industrial Distributor to show you the Magicut. You'll like this new file—and your Distributor can supply it to you quickly from his complete line.

Which of these sizes can you use?

MAGICUT FLAT

8-inch 12-inch
10-inch 14-inch

MAGICUT HALF ROUND

8-inch 12-inch
10-inch 14-inch

MAGICUT SQUARE

8-inch 12-inch
10-inch 14-inch

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For other fine files, see overleaf

NICHOLSON FILE COMPANY, 100 ACORN ST., PROVIDENCE, R. I.

(In Canada: Nicholson File Company of Canada Ltd., Port Hope, Ontario)

NICHOLSON and BLACK DIAMOND FILES

A FILE FOR EVERY PURPOSE

X.F. SWISS PATTERN FILES

precision-made for precision workers

X.F. Swiss Pattern files are the kind of tools skilled workers appreciate because the craftsmanship we put in them shows in the way they feel and the results they give. There are no finer files.

They're made to precise measurement. Their shapes are results of long study by Nicholson researchers. You can get X.F. (Extra Fine) Swiss Pattern files in dozens of shapes and sizes for precisely the job you want to do well. And you'll get 12 perfect files in every dozen.

ROTARY FILES and BURS

made by Nicholson for every power filing purpose

Hand Cut Hi-Speed Steel, Ground Hi-Speed Steel Burs and Ground Carbide Burs—you can get them all with famous Nicholson design and attention to manufacture.

We make a wide variety of styles and shapes for every power filing purpose calling for rotary files. If you can't find the standard style you need, let us know and we will work with you to create one.

Your Industrial Distributor maintains complete selections of Nicholson rotary power files of all kinds. He'll gladly help you choose the right file for your job. Always specify Nicholson for the best results and lowest cost.

NICHOLSON FILE COMPANY, 100 ACORN ST., PROVIDENCE, R. I.

(In Canada: Nicholson File Company of Canada Ltd., Port Hope, Ontario)

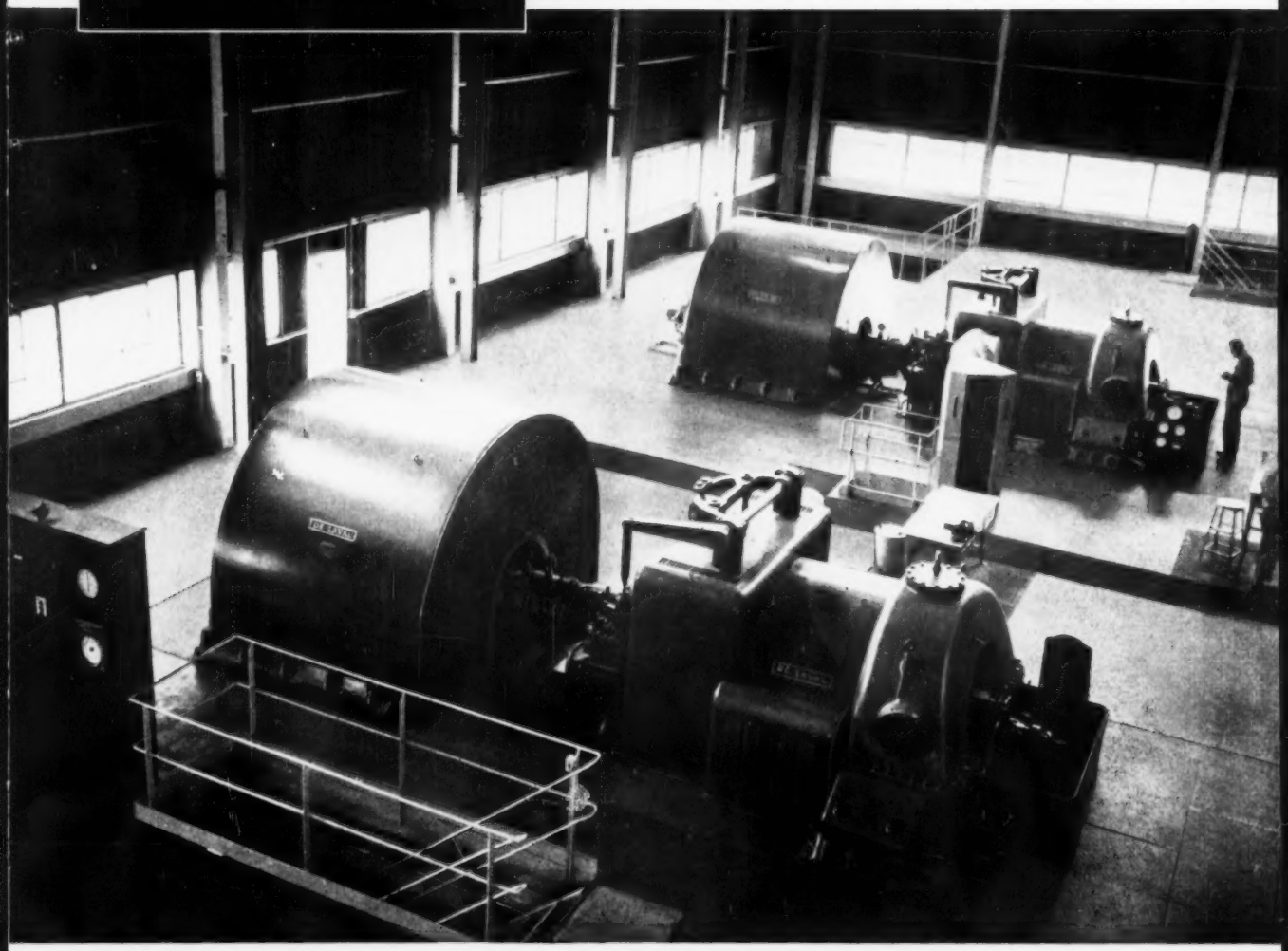
NICHOLSON and BLACK DIAMOND FILES

A FILE FOR EVERY PURPOSE

DE LAVAL

BLAST FURNACE BLOWERS

deliver 110,000 cfm each for McLouth Steel



These two De Laval turbine-driven centrifugal blowers do a round-the-clock job in the McLouth Steel plant, Trenton, Michigan. Each has a rated capacity of 110,000 cfm of air; discharge pressure is 30 psig. Each is driven by a 12,400 hp, 2950 rpm De Laval steam turbine operating under steam conditions of 600 psig, 825 F with 2″ hg.

De Laval compressors are designed individually for each application to assure maximum efficiency and range of operation. Construction is rugged throughout. Casings and perfectly balanced rotors are built to take punishment. All parts are precision-made to limit gages. Materials are selected which will best meet the particular conditions of corrosion, pressure and temperature.

De Laval centrifugal blowers are built in single and multi-stage types to supply air in volumes up to 150,000 cfm for all classes of service in steel, gas and coke plants. The wealth of application experience acquired by De Laval over the years assures a correct and economical solution to your blower problem.

Send for Bulletin 0504

DE LAVAL *Centrifugal Blowers*

DE LAVAL STEAM TURBINE COMPANY

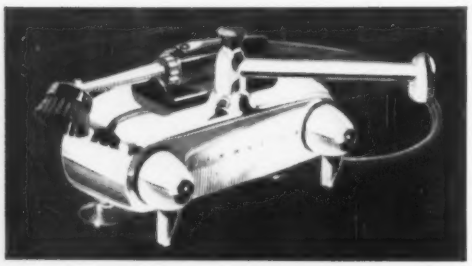
899 Nottingham Way, Trenton 2, New Jersey

DL 500

FACT: *Copper and Brass . . . today's best metal bargains!*

Competitive analysis of metal costs in manufacturing "Dishmaster" dish washer device switched manufacturer back to brighter, more attractive brass and away from plated steel and other substitutes.

PROOF: *Manville Manufacturing switches back to Brass for a better product at lower cost . . . drops steel!*



Chase

BRASS & COPPER CO.

WATERBURY 20, CONNECTICUT

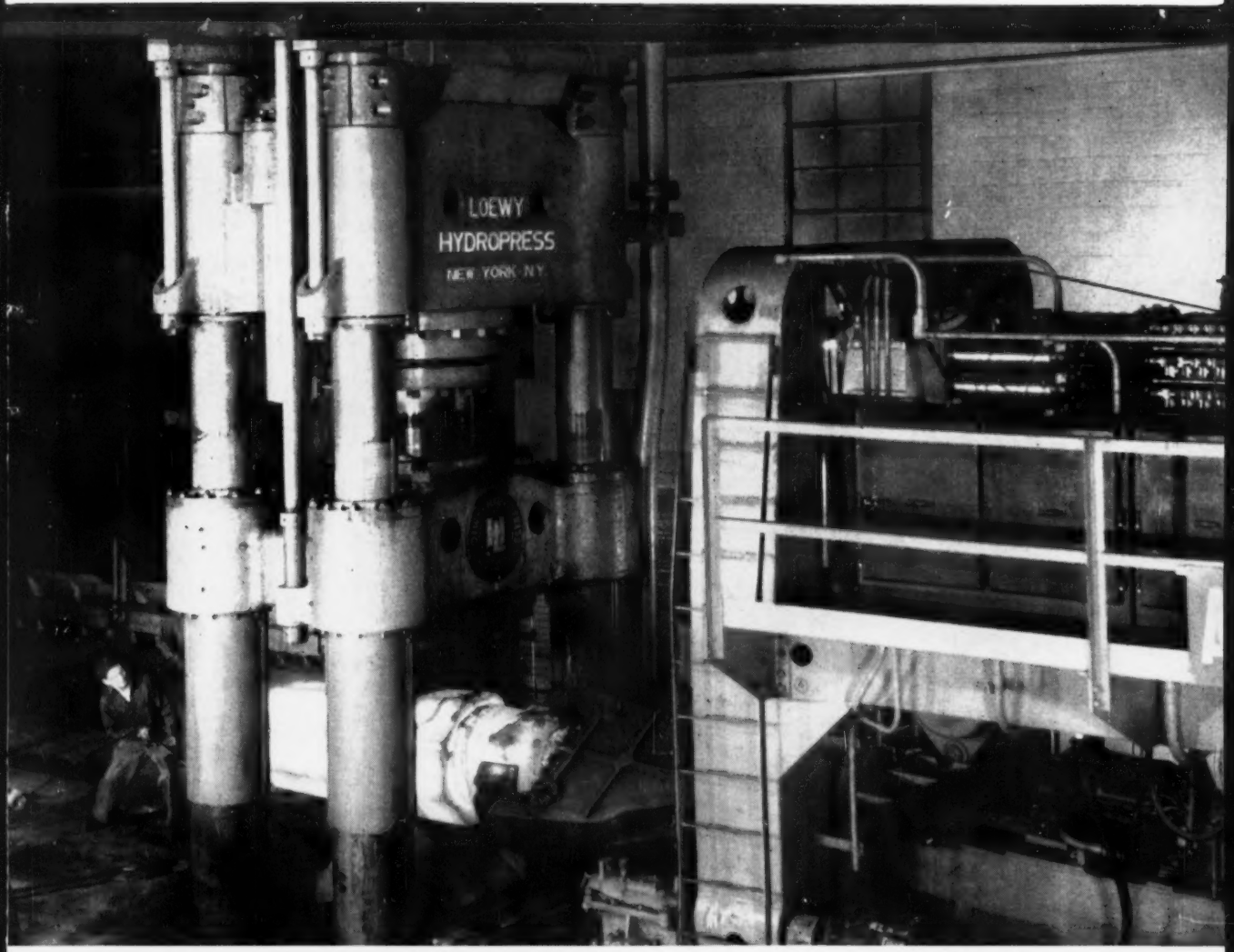
SUBSIDIARY OF KENNECOTT COPPER CORPORATION

The "Dishmaster" made by Manville Manufacturing Co. of Pontiac, Michigan, includes many small parts again being made of brass. Direct comparison of costs with cadmium-plated steel showed that brass was once again the bargain buy in metal. For example, cost of the retaining ring shown here was reduced $11.50 per thousand when the manufacturer switched back to brass! Comparable component savings are being made all down the line! (Based on October '57 costs of brass vs. steel.)

There's no excuse for using substitutes for copper and brass; the genuine article is today's best bargain in metals! Your nearest Chase man can show you specifically how Chase alloys—made of Kennecott copper—can fit into your production picture. Contact Chase locally or at Waterbury 20, Connecticut.

The Nation's Headquarters for Brass, Copper and Stainless Steel

Atlanta Baltimore Boston Charlotte Chicago Cincinnati Cleveland Dallas Denver Detroit Grand Rapids Houston Indianapolis Kansas City, Mo. Los Angeles Milwaukee Minneapolis Newark New Orleans New York (Maspeth, L. I.) Philadelphia Pittsburgh Providence Rochester St. Louis San Francisco Seattle Waterbury



Loewy-Hydropress fast-acting 2000 ton hydraulic forging press in operation at Universal-Cyclops Steel Corporation.

"This fast-acting 2000 ton hydraulic forging press imparts to special steels internal qualities never before achieved"

That's the conclusion of Universal-Cyclops Steel Corporation, a major producer of specialty steels since 1884, as to its Loewy water-hydraulic forging press.

Driven by air-loaded accumulator and equipped with oil-hydraulic effortless servo controls for both normal forging and planishing, this press was designed for extreme eccentric loading and highly economical production—like all Loewy-Hydropress equipment. Note the oversize columns, which have no reduction in area at points of maximum flexure. Due to faster displacement of metal and fewer reheats, Loewy high-speed open forging presses can outproduce hammers in working specialty alloy steels.

Loewy designs and builds open and closed die forging presses, Marform rubber-pad deep drawing presses, extrusion presses, rolling mills, and any other special machinery for hot and cold forming of steel and nonferrous metals. And because Loewy has at its disposal the vast, smoothly integrated facilities of the entire Baldwin-Lima-Hamilton Corporation, you are assured of delivery on time.

For specific information, write Dept. A-12.

Loewy-Hydropress Division
BALDWIN · LIMA · HAMILTON
111 FIFTH AVENUE, NEW YORK 3, N.Y. Rolling mills • Hydraulic machinery • Industrial engineering

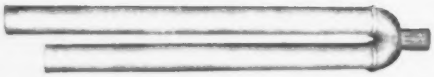
BALDWIN · BLH · LIMA · HAMILTON

THERMALLOY*

...THE RIGHT WORD FOR LONG-LIFE ECONOMY IN HEAT-RESISTANT CASTINGS

First cost is only one factor in the operating economy of high-heat-resistant castings. Extra service life, obtained through the *right* combination of physical properties and casting techniques, is a much sounder gauge of over-all economy.

That's why more and more heat-treat operators are specifying Thermalloy Radiant Tubes, Retorts, Trays, Pots and other heat-treat parts. We'd be glad to show you service life case histories to *prove* their long-life economy. Contact your nearby Electro-Alloys representative, or write for the technical bulletins listed below . . . Electro-Alloys Division, 80112 Taylor Street, Elyria, Ohio. *Reg. U. S. Pat. Off.

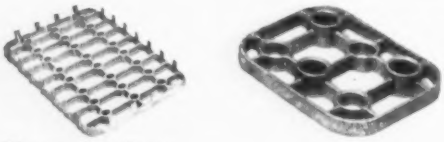


Thermalloy Radiant Tubes

Centrifugally cast to insure uniform wall thickness; pressure tested to assure freedom from leakage; X-ray controlled to guarantee soundness. *Write for Centrifugal Casting Bulletin T-283.*

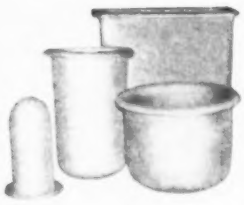
Thermalloy Retorts

Octagonal, pit-type, annealing and spiral retorts —plus baskets and spiders. Special designs and grades of Thermalloy to meet your specifications. *Write for Bulletin T-239.*



Thermalloy Trays

Experienced design know-how and casting techniques, plus Thermalloy's outstanding physical properties mean extra service life and economy. *Write for Bulletin T-227.*



Thermalloy Heat-Treat Pots

A wide range of standard sizes, or "specials" to meet your needs— all cast of long-lasting Thermalloy heat-resistant alloys. X-ray inspected, pressure tested. *Write for Bulletin T-234.*

AMERICAN Brake Shoe COMPANY **ELECTRO-ALLOYS DIVISION** Elyria, Ohio

View through door of a press forge furnace showing B&W Insulating Firebrick walls and arches and B&W 80 Firebrick floor. The burners and flues are visible on the back wall.

B&W Insulating Firebrick reduce fuel costs 15% and increase production

Experience paid off for this major steel producer. Aware of the benefits of B&W Insulating Firebrick in his drop forge furnaces, he built two new press forge furnaces with lightweight B&W IFB linings. The results were a minimum average fuel saving of 15% *and* increased production, since the entire heating process for certain grades of steel could now be accomplished in one operation. Here's why.

The lightweight and consequent low heat storage of B&W IFB linings keep the furnace walls at a uniform temperature to provide the most efficient heating conditions. Unlike heavier constructions, B&W Insulating Firebrick linings attain a uniform temperature faster with less fuel consumption.

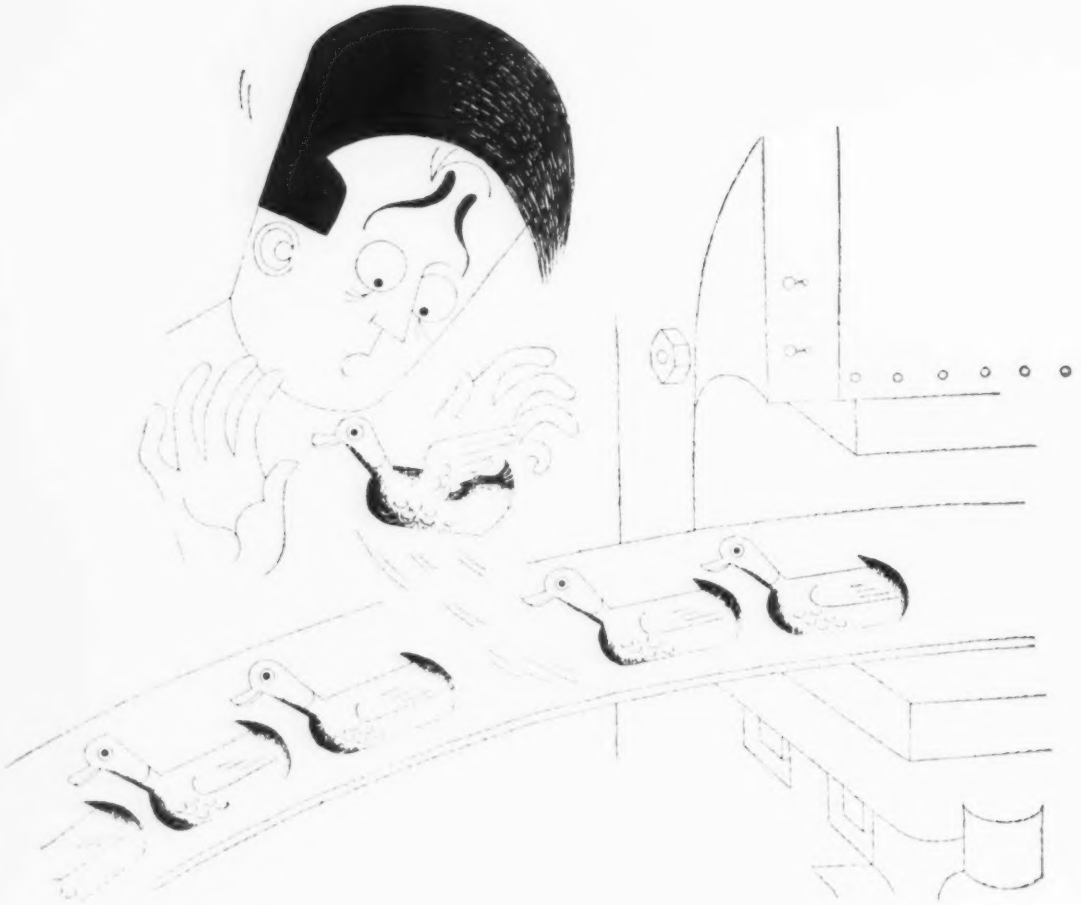
In addition, B&W IFB linings respond quicker to temperature changes, permitting more accurate temperature control. In this instance, this not only prevented the cracking of tool and stainless steels, but helped reduce the total heating cycle, increasing production.

These forging furnaces use a 9" B&W K-30 IFB wall backed up by B&W K-20 IFB. The K-30 is used as face brick because of its high temperature resistance. The K-20 is used as a backing because of its high insulating value. The hearth floor is of B&W 80 Firebrick for abrasion resistance and resistance against attack by mill-scale at the temperatures involved. Door linings are of B&W Kaocast and B&W Kaolite.

B&W REFRACTORIES PRODUCTS: B&W Allmul Firebrick • B&W 80 Firebrick • B&W Junior Firebrick • B&W Insulating Firebrick • B&W Refractory Castables, Plastics, and Mortars • B&W Silicon Carbide • B&W Ramming Mixes

BABCOCK & WILCOX

THE BABCOCK & WILCOX CO.
REFRACTORIES DIVISION
GENERAL OFFICES: 161 EAST 42nd ST., NEW YORK 17, N.Y.
WORKS: AUGUSTA, GA.



Got a metal stamping problem?

You may need the machinability and toughness of **AIRKOOL-S** Tool and Die Steel—one of the many Crucible Tool Steels available from stock

You can cut machining costs, get longer tool and die life by using a steel that offers machinability *plus* high resistance to abrasion and wear.

Airkool-S Tool and Die Steel provides both these qualities. It machines 25 to 35% easier than conventional A2 steel and is easily broached and filed. Yet it's tough, non-deforming and deep-hardening—just what you need for blanking, coining, shearing and punching.

Crucible Airkool-S Tool and Die Steel is only one of the dozens of tool steel grades stocked at local Crucible warehouses. Ask the Crucible staff about any grade. They'll gladly give you complete information and first-hand assistance with fabrication.

Crucible is the only specialty steel producer *fully integrated to the point of use.* That means control and responsibility from raw material to warehouse delivery to you.

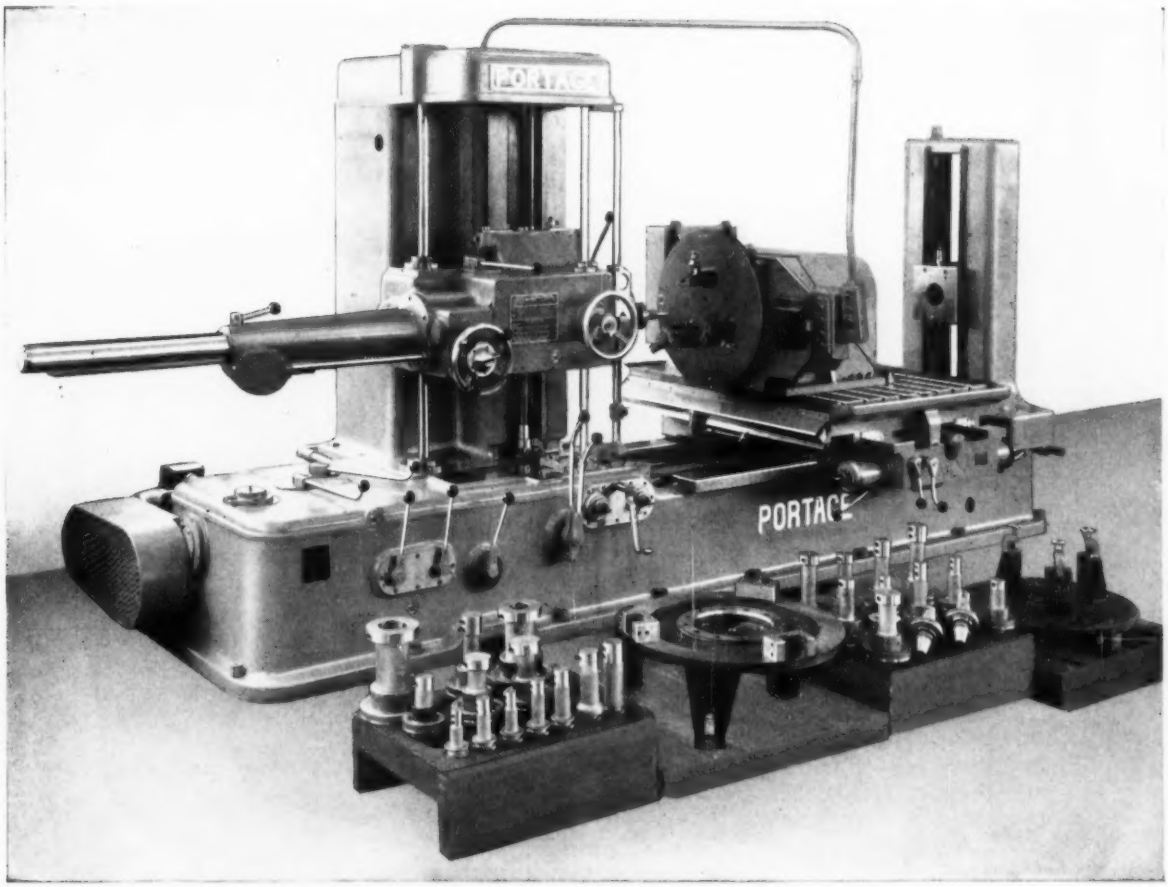
STOCKS MAINTAINED OF:

Rex High Speed Steel . . . ALL grades of Tool Steel (including Die Casting Die and Plastic Mold Steel, Drill Rod, Tool Bits, and Hollow Tool Steel Bars) . . . Stainless Steel (Sheets, Bars, Wire, Billets, Electrodes) . . . Max-el, Hy-Tuf, AISI Alloy . . . Onyx Spring, Hollow Drill Steel and other special purpose steels.

CRUCIBLE WAREHOUSE SERVICE

Crucible Steel Company of America

General Sales Offices, The Oliver Building, Mellon Square, Pittsburgh 22, Pa. Branch Offices and Warehouses: Atlanta • Baltimore Boston • Buffalo • Charlotte • Chicago • Cincinnati • Cleveland • Dallas • Dayton • Denver • Detroit • Grand Rapids Harrison • Houston • Indianapolis • Los Angeles • Milwaukee • New Haven • New York • Philadelphia • Pittsburgh • Portland, Ore. Providence • Rockford • San Francisco • Seattle • Springfield, Mass. • St. Louis • St. Paul • Syracuse • Toronto, Ont.



Tooling is P.D.Q. Quick Change including Sure-Bore micrometer cartridges.

PORTAGE builds "special tooling" on new 4 inch Horizontal Boring, Drilling and Milling Machine for...Westinghouse Gearing Division

Write for Catalog covering the 4 and 5 Inch PORTAGE MILLS

This new 4 inch machine was built with a special vertical power indexing table. Unit can be set to index at any range with variables of 15 degrees between stations. Indexing accuracy can be held to less than 5 seconds of arc. Indexing and clamping are fully automatic with means for inching the table for setting-up purposes. This Westinghouse machine is just one example of the special purpose work being done for PORTAGE customers . . .

The Portage Machine Co. invites your inquiry for machines requiring special tooling . . . and remember . . . it costs less to buy, operate and maintain a PORTAGE.

THE Portage MACHINE CO.

1035 Sweitzer Avenue • Akron 11, Ohio

Representatives in Principal Cities

BUILDERS OF PRECISION MACHINE TOOLS, SPECIAL AND PRODUCTION MACHINERY SINCE 1916

"...a publication must be proved

Philip C. Wallach is truly a New Yorker. Born and educated in that city, he has also built a successful career there. Prior to going with H. K. Porter Company, Inc., in 1954 as Director of Public Relations and Advertising, Mr. Wallach was in charge of public relations for W. R. Grace & Co., and before that editor of Shell Oil Company's "Shell News." We recently stopped in to talk with Mr. Wallach on the subject of trade and industrial publications. The information he gave us is both interesting and worth while. Here are the highlights of our discussion.

Q How long ago was H. K. Porter Company organized?

A The business was started just about 80 years ago. However, it has undergone several reorganizations since that time—most recently in 1939 under the aegis of our president, Mr. Evans.

Q And just how do you describe H. K. Porter Company?

A We are a diversified company with 11 divisions in the fields of industrial rubber, high-tension electrical equipment, refractory materials, ferrous and nonferrous materials, and fabricated steel products, including wire rope, forged steel fittings, saws and tools.

Q How long have you been advertising?

A Our various divisions have been advertising for a long time. However, our corporate advertising and our integrated product advertising date back only a few years.

Q What are your basic advertising objectives?

A We have several. First of all we advertise to build a corporate identity for H. K. Porter Company. Then we advertise to build prestige for and give a sharp identity to the different divisions. And of course we advertise to help sell our products.

Q Do you use both consumer and trade publications?

A Yes we do. However, you must understand that much of our effort is directed to the trade and industrial levels. Only one of our 11 divisions manufactures products which go direct into the consumer market—the Henry Disston Division, saw manufacturers.

Q How many trade and industrial publications do you now use?

A More than 165.

Q What do you look for in such a publication before you are willing to advertise in it?

A Editorial integrity, which I believe to be extremely important. The reader, the man we are trying to reach with our advertising messages, will not buy a publication unless he is convinced that he can benefit from its editorial content. So, to be a good advertising medium for us, a publication must be proved and accepted in its particular field.

Q Do you make the decisions regarding the addition of publications or do you depend upon recommendations from your several advertising agencies?

A We make the final decisions, but we arrive at them through combined effort. Most of our various divisions have an advertising manager who is a member of my staff. These men, naturally, are well up on the various publications which cover their particular fields of interest and make original recommendations. The agency media people also make recommendations, and the result is therefore the product of a joint effort.

Q Would you say that you are not so much concerned with the actual circulation figures as with the acceptance and editorial policies of a trade or industrial publication?

A That is correct.

Q How do you describe the role or function of the trade and industrial press?

A The function of trade and industrial magazines is to present their readers—a special class of readers—with all of the information so necessary for a man to have if he is to move ahead in his business or profession—news about his field, new products, new methods, and the like. In doing so, I believe that it is the responsibility of these publications to avoid anything irrelevant — the entertaining and the amusing that we expect of consumer publications. Such material is out of place in business magazines.

Q Wouldn't you say that trade and industrial magazines have just about eliminated that sort of thing?

A I think that many such publications are making great strides. When I first joined Porter, I had no experience at all in trade and industrial advertising. As a result, I would spend four or five nights each week at the public library studying the leading magazines in our fields of interest. I not only reviewed current issues, but went back through the years. It gave me a chance to see how much they have changed. Stuffers like cartoons and jokes are mostly out. Articles are better written and presented. Layouts and formats are improved. There is every evidence that the editors of today's business press have a high sense of responsibility in all that they do.

and accepted in its particular field"

Q Is there any one particular advertising format which you find to be especially successful when used in trade and industrial magazines?

A We find the use of case histories particularly effective. However, we believe that their usefulness is materially reduced unless you can use the name of the company or individual involved.

Q Are you adding steadily to the list of publications that you use?

A Yes we are.

Q How do you merchandise your advertising to your sales force and other interested parties?

A In different ways. It varies somewhat with the division, but in general each of our advertising managers advises his salesmen, distributors and jobbers well in advance of all advertising scheduled for a given period. Some divisions pass this information along monthly; others, because of the nature of the products, advise their people quarterly. This happens to be one of the things that we are working on at the present time and we are anxious to establish an overall policy just as quickly as we can do so.

Q How do trade and industrial publications help Porter?

A As I have explained, the nature of our business is such that we must concentrate much of our activity at the trade and industrial level. Trade and industrial publications permit us to effectively cover our markets. They make it possible for us to do a good job with pinpoint accuracy and on a reasonable budget.

Q And do you feel that the trade and industrial press will continue to improve in value and influence?

A I think this is a safe assumption. It is certainly indicated by the type and talents of the young men who are joining the editorial staffs of the various publications I know about. They seem not only to be good editors and writers—real professionals—but they are exceptionally at home in the industries with which they are associated.

Q Do you believe that the advertising pages of a trade or industrial magazine are of real value or importance to the reader?

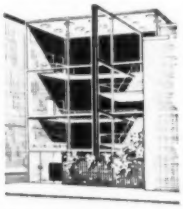
A Indeed they are. While I am convinced that people are influenced to buy a particular magazine because of its editorial content, I am certain that the information they find in advertisements is valuable to them too.

Q Have you ever had the opportunity to measure the effectiveness of any message carried in trade and industrial publications?

A We have, and the results are most interesting. Just several years ago we started to promote the initials HKP as our new logo or trademark. In 12 months recognition in tested cities jumped from practically zero to as much as 300% and 400%. In one or two instances the percent was considerably higher than this. It is true that we did not confine our promotion solely to advertising in trade and industrial publications, but these magazines did carry the bulk of the effort and the results certainly indicate the effectiveness of such advertising.

Through the use of trade and industrial publications you are able to communicate with your customers and prospective customers in an atmosphere that is natural to them and most productive for you. Today's reliable business press serves a purpose unduplicated by any other selling force.

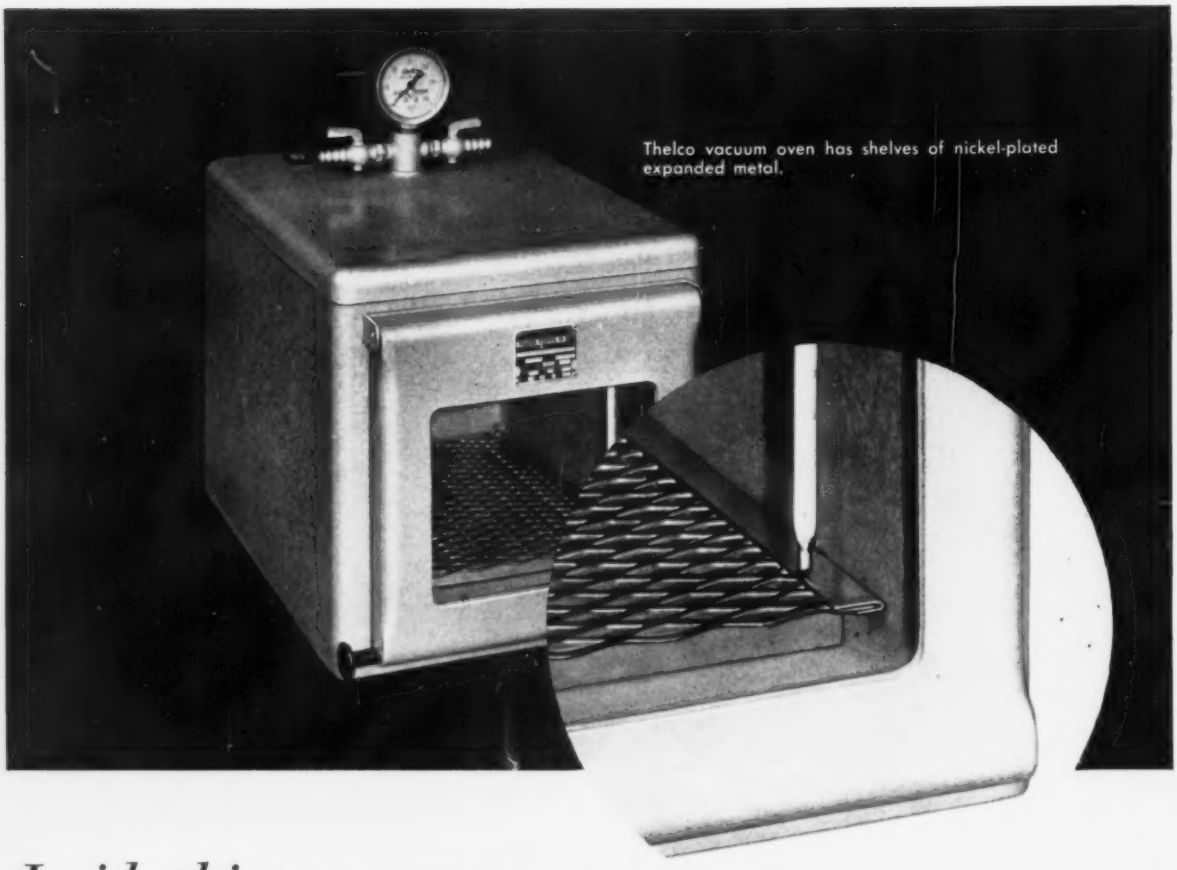
Chilton publications cover their chosen fields with an editorial excellence and a strict control of circulation that assure confidence on the part of readers and advertisers. With such acceptance goes a proportionate selling power.



Chilton
COMPANY

Chestnut and 56th Streets • Philadelphia 39, Pennsylvania

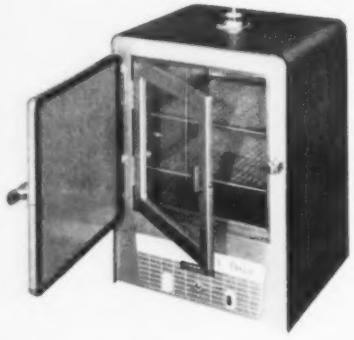
CHILTON PUBLICATIONS: Department Store Economist • Hardware Age • The Iron Age • Jewelers' Circular-Keystone • Distribution Age • Motor Age • Automotive Industries • Optical Journal and Review of Optometry • Spectator • Commercial Car Journal • Boot and Shoe Recorder • Hardware World • Gas • Electronic Industries • Butane-Propane News • Book Division



Thelco vacuum oven has shelves of nickel-plated expanded metal.

Inside this vacuum oven...

functional, durable, expanded metal at work



Thelco incubator with doors opened, showing expanded metal shelves. A product of Precision Scientific Company, Chicago, Illinois.

When the shelving you are using has to stand up under heat and heavy use, and must also provide free circulation of air—that's the time to call for Penmetal expanded metal.

Here's a case in point: Precision Scientific Company, the manufacturer of Thelco laboratory ovens and incubators, puts durability into shelving by making it out of nickel-plated Penmetal expanded metal. Shelving stays bright and clean through many years of service. It's exceedingly strong and weighs next to nothing. What's more, heated air can circulate freely, thanks to the open mesh, and the shelves are inexpensive to fabricate.

Functional, durable shelving—still another example of the versatility of expanded metal. Actually, it has thousands of uses. In fact, there's a fine chance its application can improve your product.

Send for descriptive booklet which includes mesh sizes, weights and dimensions. Ask for catalog 509-EM.

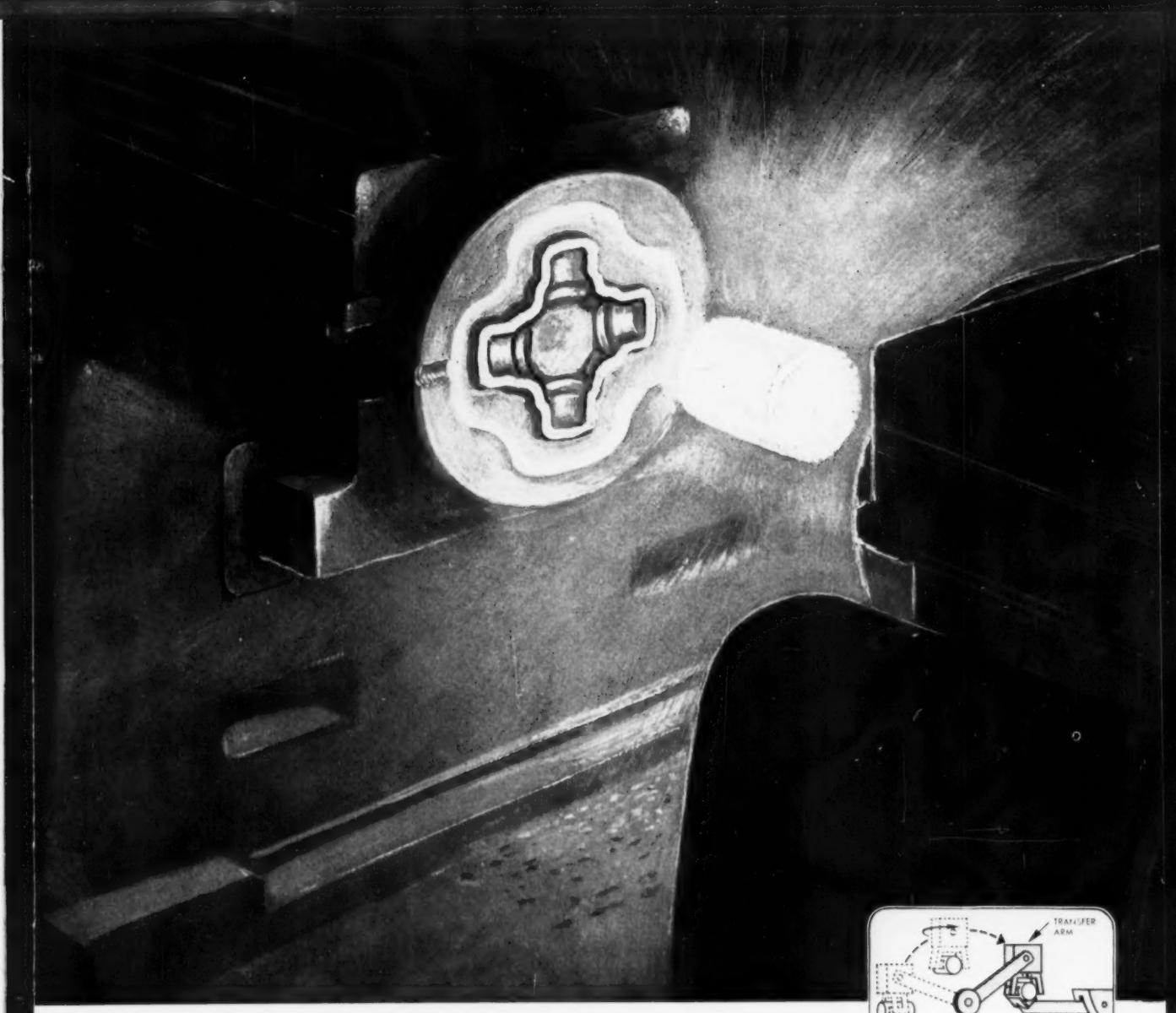
PENN METAL COMPANY, INC.

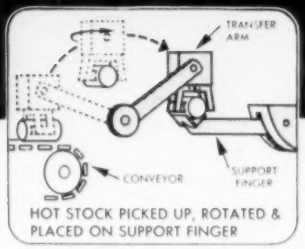
General Sales Office: **40 Central Street, Boston 9, Mass.**
Plant: Parkersburg, W. Va.
District Sales Offices: Boston, New York, Philadelphia, Pittsburgh, Detroit, St. Louis, Dallas, Little Rock, Seattle, San Francisco, Los Angeles, Parkersburg

METAL MARK Penmetal 1869 OF QUALITY

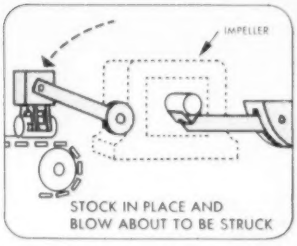
a name to remember

PM-153

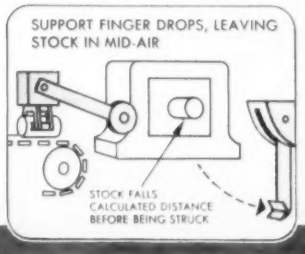




HOT STOCK PICKED UP, ROTATED & PLACED ON SUPPORT FINGER



STOCK IN PLACE AND BLOW ABOUT TO BE STRUCK



FORGING IN MID-AIR . . . without grips . . .

without sprues . . . without shock or vibration, *in a completely automatic operation!* This is but one of the possibilities in Cecomatic Forging based on the revolutionary Chambersburg Impacter and utilizing the Cecomatic Gravity Feed. Investigate the potentialities of the Cecomatic Process for forging production in varying degrees of automation. Write or phone us.

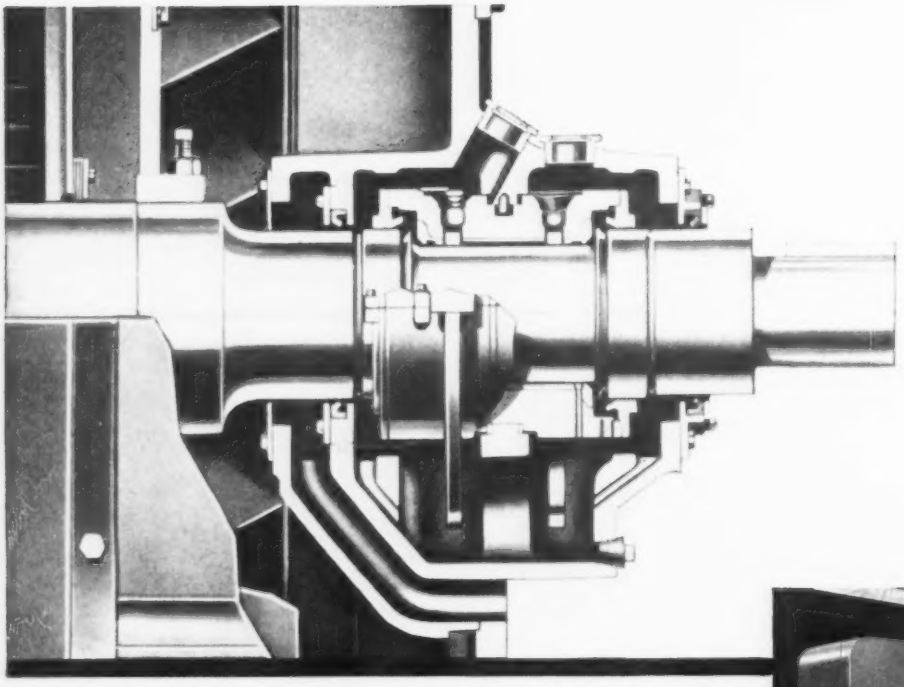
CHAMBERSBURG ENGINEERING COMPANY • CHAMBERSBURG, PA.

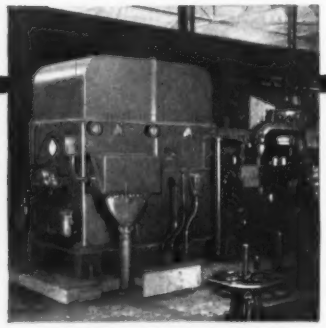
Shockless, vibrationless forging *in the IMPACTER is the basis of*

THE CECOMATIC FORGING PROCESS

One of the many reasons why **ALLIS-CHALMERS MOTORS**
operate dependably in the

METAL WORKING INDUSTRY





Two-pole motor driving descaling pump.

Motor Bearing is pressure-equalized with vent

SHAFT seals and a pressure-equalizing vent give double protection against oil leakage from this Allis-Chalmers motor bearing. First, seals keep oil inside the enclosure. Second, the pressure-equalizing vent chamber maintains atmospheric pressure at the inboard side of the bearing, so that fan action won't pull oil vapors out of bearing, under any conditions. This double protection assures oil-free motor interior and drip-free operation.

Accessible, Too!

Motor inspection is easy with capsule-type bearing housings. Upper halves of motor end shield and inner air baffle can be removed without opening the bearing enclosure or disturbing bearing alignment.

For details on these and other features of Allis-Chalmers motors, call your nearby A-C office or write Allis-Chalmers, Power Equipment Division, Milwaukee 1, Wisconsin.

A-C ALLIS CHALMERS

ALLIS-CHALMERS

A-5478

Renewed Interest

Machine tool builders, once cool to the idea, are showing more interest in standardized automation units. Auto firms are setting up informal committees, sounding out automation suppliers on practicality and cost of building-block programs. One view holds building-block automation could spark upswing in market for such units.

Still Wider Sheets

The trend toward wider aluminum sheets is continuing. Alcoa completed a 160-in. breakdown mill at Davenport in July of this year. Now Kaiser is installing a 168-in. mill at Ravenswood, W. Va. Another major producer is reported ready to go ahead with a 170-in. breakdown mill, plus wide finishing stands.

Warns of Fatigue

Using a new method, testers look for a bubble to form at the point of crack nucleation in standard test specimens. When it shows up, it spells trouble. It's evidence of impending fatigue. Such bubbles can be viewed by the unaided eye. They show up only in certain metals, notably aluminum. Response in mild steels and stainless varies from moderate to weak. Brass and zinc show no signs of bubbles prior to failure.

Electronic Drilling

Using a process quite distinct from electronic corrosion methods, a new electron drilling machine developed in Germany will soon be operating in this country. It's reported that the new machine can drill holes in stainless steel disks in 15 seconds.

Crash Science Program

Political concern over slippage in U. S. scientific programs is mounting. Senate Majority Leader Lyndon Johnson urges fast government action in three areas as a start toward regaining the lead: (1) Create a centralized federal missile authority. (2) Utilize fully the scientific talents of retired persons. (3) Set up a national science academy to teach advanced physics and other vital subjects.

High-Pressure Casting

At least one governmental agency is now sponsoring a test program on high-pressure casting of ferrous alloys. Interest in high pressures is especially significant. It could stem from recently acquired knowledge of the metallurgy of iron meteorites—all of which were originally formed under tremendous pressures. The high-pressure technique may uncover an entirely new family of ferrous alloys.

Steel Mill in Oil Fight

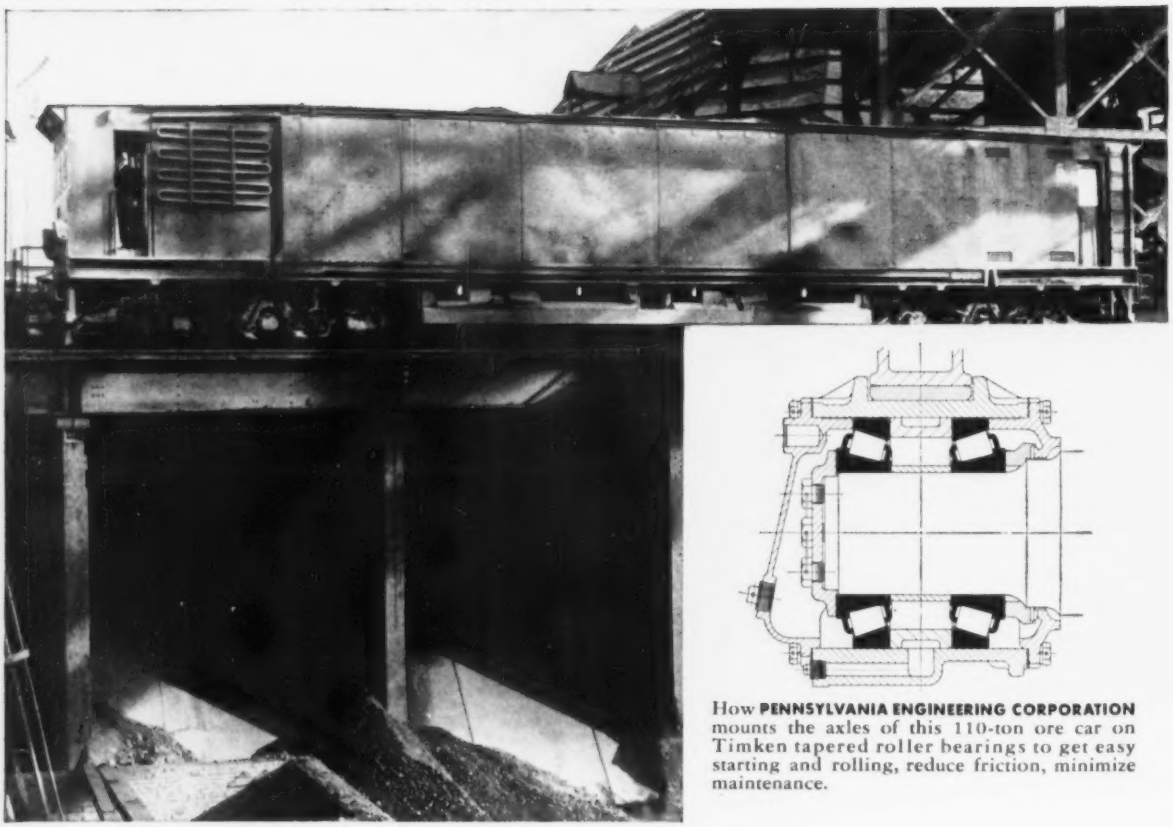
At least one steel mill is putting up a fight to recapture the market for coke distillates that it lost to the petroleum industry a few years back. The firm is installing a unit to make distillates comparable in quality to highly refined petroleum products. Other mills are watching with interest, may follow suit.

Calipers for Hot Metal

A new development permits accurate measurement of hot worked steel at convenient distances. It's an instrument based on optical principles. The special lens system makes the size of image independent of distance from the object.

Steel's Break-Even Point

The coming year will see the first real test in several years of the steel company break-even points. Back in '54 one small specialty company made a profit at 35 pct of capacity; a big firm had fair earnings at 65 pct. Modernization has lowered many such points. Nation's fourth largest producer, Jones & Laughlin, checked its data recently, can show a profit at 50 pct of capacity.



How **PENNSYLVANIA ENGINEERING CORPORATION** mounts the axles of this 110-ton ore car on Timken tapered roller bearings to get easy starting and rolling, reduce friction, minimize maintenance.

New 110-ton ore car starts easier, rolls smoother and longer on Timken® bearings

BECAUSE this ore car carries a whopping 110-ton load, it has to be easy to start and keep rolling. It's a natural spot for Timken® tapered roller bearings. And it's no wonder that Pennsylvania Engineering Corporation used them on all 6 axles.

Because Timken bearings *roll* the load, starting resistance is cut up to 88%. There's no metal-to-metal sliding friction. Fully loaded cars start easier, with less power loss.

Geometrically designed and precision-made to roll true, Timken bearings virtually eliminate friction. Cars roll smoothly.

And Timken bearings take the tremendous weight and heavy shock loads. Their rollers and races are case-carburized to have hard, wear-resistant surfaces over tough, shock-resistant cores. Full line contact between rollers and races gives Timken bearings *extra* load-carrying capacity. Their taper lets Timken bearings take both radial and thrust loads in any combination. No costly extra thrust devices are needed. Bearing life is longer, maintenance is minimized.

What's more, by holding housings and shafts concentric, Timken bearings make closures more effective. Dirt and dust stay out. Lubricant stays in.

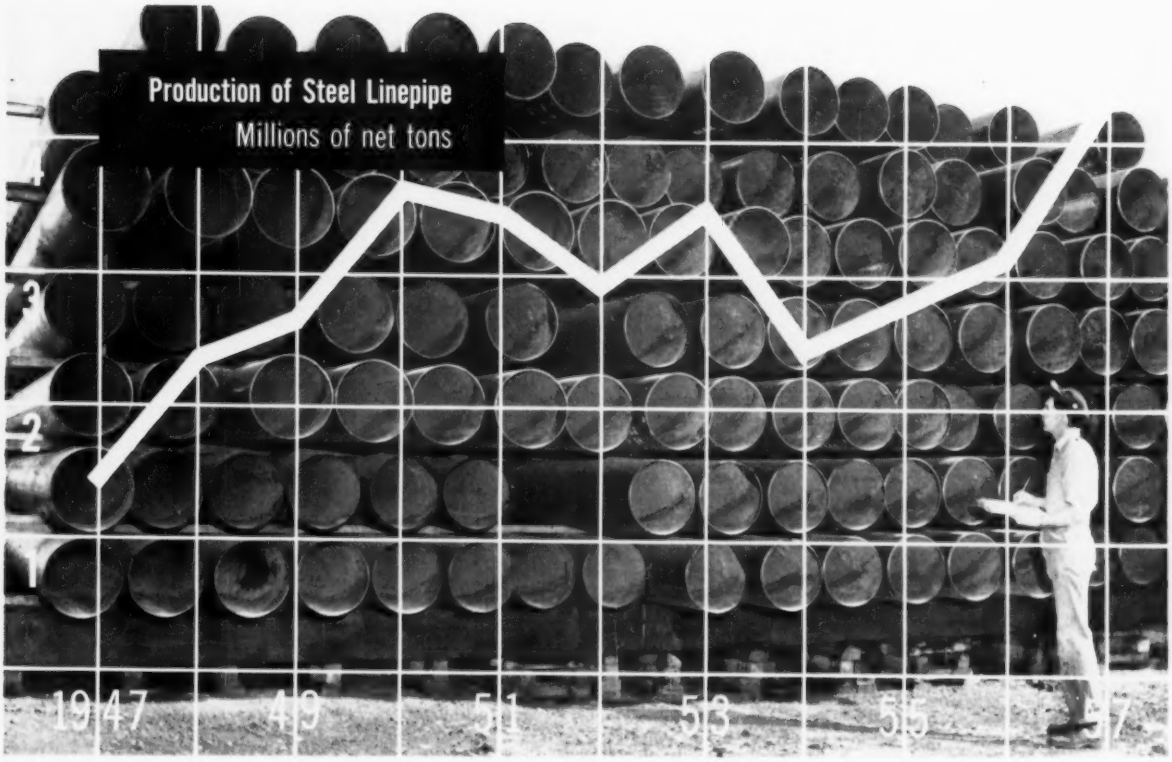
For all these advantages, specify bearings trade-marked "Timken" for the machines you buy or build. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

TIMKEN BEARING EQUIPPED

This symbol on a product means its bearings are the best.

TIMKEN

TAPERED ROLLER BEARINGS ROLL THE LOAD



1957—Iron Age estimate

Business Is Good, But Linepipe Market Develops Leaks

Some Think the Letdown Is Only Temporary

Bookings still three years ahead. But bottlenecks undermine the market. One producer is off allocations. Rolling time will be available in first quarter. —By T. M. Rohan.

▪ Large diameter welded pipe, which has enjoyed air-tight bookings as far as 3 years ahead, is starting to spring a few leaks.

Some natural gas pipeline projects are taking three years to clear the Federal Power Commission. Others are being cancelled because of difficulty in financing or general business outlook. And a proposed increase in tariff from the present 15 pct to 22.5 pct on U. S. pipe going into Canada threatens more cuts.

Government Bottleneck — The FPC backlog in June involved 10,883 miles of pipe, cost of projects totaled $1.1 billion. For instance, in Illinois, 100,000 potential customers in the Chicago area, and another 100,000 in the northern part of the state are waiting for natural gas. The People's Gas Light and Coke Co. filed an FPC request through its subsidiary, Natural Gas Pipeline Co. of America, in February, 1956. Hearings began this year. It is improbable a certificate will be granted until mid-1958.

Large diameter welded pipe is still the longest delivery major steel product in the U. S. mills have orders for 3 years ahead. Output last year was about 3 million tons. But openings are developing—with some rolling time open as early as

A Bottleneck in Linepipe Installation

An Overworked Federal Power Commission:

▪ **Every independent gas producer must get Federal Power Commission approval before selling a cubic ft. This has slowed construction. When the ruling was handed down by the U. S. Supreme Court three years ago it doubled the FPC workload.**

An application could take anywhere from 60 days to 3 years to be approved. Here's how it works:

Application—1 to 3 weeks to check for completeness of data.

Notice of Application Issued—3 weeks or so to give opposing parties a chance to comment or object.

No Objection—Final certificate in 2 weeks.

Objection—Opponents given time to prepare and file briefs.—Hearings are held at which everyone may talk at length.—Staff studies the situation and makes recommendations to an examiner for decision.—If his verdict is protested the case goes to the full Commission.

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the first quarter, 1958. One Midwest producer has gone off allocation and is urging all sales offices to re-check long term delivery commitments.

West Up in The Air—The West Coast outlook is even more uncertain. Six months ago mills were booked solid into 1960. But the contracts are, of course, provisional. Now order books are shot with holes. It is doubtful western facilities can be operated at capacity through 1958. Salesmen are scrambling for every ton.

There's also a question on whether the area can bring in gas from Canada, that affects the pipe order book.

There have been numerous postponements and some complete cancellations on large gas pipeline projects. Where there were firm commitments, customers are accepting the pipe for stockpiling.

Only Temporary — Some steelmen see only a temporary let-down. "We have some first quarter holes now," a leading Ohio steelman says. "But we expect to be back at capacity from the second quarter on. We have, in effect, cancelled out some tonnages because we think the line builders won't be able to get the financing. We haven't told them of course because they might come through. In the North it's also a seasonal business but by the second quarter we should make a strong comeback."

Other producers are making short delivery of emergency shipments of 15,000-20,000 tons by pirating from orders on which there's no hurry.

Pipe Traders—Earlier this year the situation was reversed. East Ohio Gas Co., Cleveland, had to work out a king-sized swap to complete a 115 mile line. Engineers wanted a 30 in. diam pipe to tie in with the Texas Eastern pipeline at Summerfield, O. All it could get was 10 and 12 in. from a producer. But a swap was worked out among pipe producers and their customers across the country. The line is nearing completion.

Also, a sagging seamless oil country goods market makes availability of steel no longer a limiting factor. Full capacity of the welding mills can be utilized, and mills are producing ahead of schedule.

Canadian Caper — Canada now collects 15 pct duty on all pipe over 10.5 in. I.D., except for exploration. The Tariff Board of Canada is recommending a 50 pct increase, to 22.5 pct which would make it difficult for U. S. producers to compete with new Canadian plants.

Some U. S. producers are seriously thinking of pushing for an increase in U. S. tariffs or voluntary quotas on imports. Canadian, Japanese and Italian pipe, sold through brokers, is cutting into U. S. markets. A bill setting up quotas was introduced in Congress last May and is due for a vote next year.

Order Pipe First—Line pipe is one of the few products booked more than a year in advance. Companies planning to put up transmission lines need a commitment for the pipe in order to line up FPC approval, financing, rights-of-way, construction crews and machinery. They are not iron-clad commitments, but also are not subject to duplicate ordering like other steel products. So order books are not liable to evaporate in a loose market. On the other side of the coin, orders are placed for huge quantities. So a single cancellation can wipe out several weeks total production for a plant.

Principal producers of large diameter sizes, 14 in. and up, are Youngstown Sheet and Tube, Consolidated Western and National Tube Divisions of U. S. Steel, Republic Steel, Bethlehem, A. O. Smith Corp., Colorado Fuel & Iron Corp. and Kaiser Steel. National Tube at Lorain and Youngstown Sheet and Tube at Youngstown make Ohio the top state at 875,000 tons capacity.

Undoubtedly one of the major bottlenecks is the overworked FPC. Only relief in sight is passage of the pending natural gas bill in Congress.

Progress, But — FPC Chairman Jerome K. Kuykendall says the Commission is making "reasonable progress in disposing of construction cases." During the fiscal year ending last June 30, the Commission disposed of 212 construction applications covering 8,070 miles costing $674,546,931, with com-

pressor horsepower of 402,105. This includes projects rejected.

There were pending at the beginning of the last fiscal year some 174 construction applications, so the Commission approved more applications than it had on file. But the backlog actually increased because of an increase in filings.

Spent $2 Billion—Despite the bottlenecks, pipeline construction is continually expanding. The gas industry construction budget for 1957 topped $2 billion for the first time for overall production. The largest segment by far—$1.16 billion—is going into 10,040 miles of new transmission and equipment.

Money budgeted to lay 10,040 miles of linepipe for gas transmission was $842 million, compared to $265 million in 1956.

Biggest single project is the Trans-Canada Pipe Lines Ltd., now building a 2287 mile 24 and 30 in. line from the Western Alberta-British Columbia fields to Toronto and Montreal. The 1957 expenditure alone will be $98 million for about 785 miles.

Gas, a Chilton publication, reports the way has been cleared to pipe natural gas into Florida. Coastal Transmission and Houston Texas Gas & Oil Corp. will jointly lay more than 1600 miles of linepipe.

Gas Near the Top—The gas industry as a whole now ranks fifth in the U. S. in plant investment. Producers serve over 38 million customers, who own nearly 100 million gas appliances. According to the American Gas Assn., New York, annual sales top $4 billion. By 1965 business is expected to more than double. Sales will total close to $11 billion annually. A lot of linepipe will be needed to carry the additional load.

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., The IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

DOWN IN THE VALLEY: Large section of linepipe running through humid areas must be made impervious to the moisture-laden atmosphere.

HIGH IN THE HILLS: Pipe running over mountains must be insulated to prevent sharp changes in temperature from affecting the cargo.

Why Companies Move to Florida

There Are Two Answers: Labor and Land

Light industry is finding the state's industrial climate to its liking.

Shipping disadvantages are often outweighed by other factors.—By Floyd Lawrence.*

■ Florida has lures for industry as well as tourists. The two prime ones it offers companies starting up or relocating are labor and space.

Not all firms find the Florida industrial climate healthy. Those who do generally fit into a pattern: They are companies which require skilled workers, technicians or engineers hard to locate in other areas. Their product has a relatively high value in relation to its weight — overcoming the disadvantages of freight costs. They sell to large markets, often national or international in size. They are often branches or divisions of larger companies which are expanding—frequently engineering, research or development facilities.

Willing Workers—Firms exploring Florida's industrial potential are pleased by the availability of skilled labor. Typical is the experience of the industrial engineering firm of H. K. Ferguson Co.

Ferguson ads for engineers in Northern newspapers were attracting few applicants. Then — after being contacted by the Ft. Lauderdale Chamber of Commerce—the company agreed to interview prospects for work at a possible Ft. Lauderdale office. When the interviewer arrived he found 148 aplications, 80 pct from local residents, waiting for him.

The company had little trouble in hiring 60 qualified engineers and draftsmen and is still receiving unsolicited applications. "Not all those applying are qualified," says Charles B. Wilkie, Division Chief Engineer, "but in many cases we can refer them to companies who can use them."

High Response—Enthusiasm of the Florida worker is also mentioned by Wilkie. "Not only is job turnover and absenteeism low," he says, "but the level of job interest is higher than I have seen since the 1920's. These men are glad to be in Florida and working in their chosen field."

Another firm — Foster-Wheeler Corp.—had a similar experience in looking for engineers with experience in boiler design. They obtained 60 applicants by listing jobs in Florida papers and didn't find it necessary to conduct any follow-up advertising.

Companies setting up shop in Florida have found employment magic in the state's name. Pratt & Whitney Div. of United Aircraft Corp. ran blind ads for engineers, in one mentioning "Florida" and in the other "New England." The Florida ad pulled 30 responses to every one the "New England" ad did.

Quiet Wanted—However, Pratt & Whitney's main interest in moving to Florida wasn't labor; it was space. At its main plant in East Hartford, Conn., the firm had to heavily muffle jet engine test cells because of its location in a fast-growing area. As a result the test cells cost $500,000 each.

Making the tests in an isolated area seemed the answer. Yet the spot selected would have to be close to residential areas, schools, and churches. It was found 20 miles from West Palm Beach where jet engines are now tested in structures almost like carports.

The test cells consist of concrete slabs on the ground on which the engines are mounted. There's a test panel anchored on one side and four supports holding a roof overhead. The jet engines blast off unmuffled into the Everglades, disturbing nobody. Four of the test cells cost less than one formerly did in East Hartford.

Heading Inland—Pratt & Whitney's Florida location — some 20 miles inland — may indicate the shape of things to come. Industrial engineers believe the inland area offers the best prospect for industrialization. They are willing to concede that the coastal areas are too closely tied to the tourist trade.

Developers point out that bed rock is closer to the surface in the inland areas, only four or five feet as compared with 35 to 40 feet along the coast. In many locations the filling in of mucky swamplands would be required for plant sites. However, engineers stress that only three or four feet of fill is needed

*Mr. Lawrence is an industrial writer.

Industry Blooms in Sunshine State

	Number of Plants	Aver. Employ.	Total Wages (in thousands)	Value Added
Chemicals and allied products	233	9523	$34,089	$81,814
Primary metal industries	41	910	2,552	5,179
Fabricated metal products	330	7086	25,759	52,160
Machinery (not electrical)	174	2777	10,065	19,237
Electrical machinery	59	905	2,564	4,411
Stone, clay and glass products	337	5227	15,975	36,535
Furniture and fixtures	326	4675	13,913	23,175

Source: U. S. Census Bureau

as against many times that amount for some areas in the North.

Plans call for a network of railroad spur lines built into the interior of the state supplementing the three railroads now serving the coastal areas. They could be coupled with a canal or series of canels from the ocean or the Gulf of Mexico. Also considered are low-cost highways which would be built to serve the new communities.

Shipping Costs Balanced—Many firms find the freight disadvantages in Florida are not a major problem. An example is Airpax Products Co. which makes electronic components in Florida and Baltimore. Because some parts Airpax produces are worth more than $40 an ounce in shipping weight, the firm finds that freight increases in materials and finished product are small in its over-all cost picture.

"Costs here about balance out with our costs of doing business in Baltimore," says Joseph H. Dugan, Comptroller, "and those that are a bit higher are offset by others somewhat lower."

Airpax transformers, an item on which freight is important, are still manufactured at the firm's Baltimore plant. "Bringing them to this plant, actually an expansion, is not economically justifiable," says Dugan.

Another Firm—Aircraft Fittings Co.—is finding ways around shipping problems. The company moved from Cleveland where there was difficulty in finding men who could work to its tolerances in producing hydraulic fittings for aircraft frames and engines.

With only about 40 producers of automatic screw machine products in Florida, Aircraft Fittings had trouble getting the screw machine stock of the quality wanted. However, they found they could order material from New York or Cleveland and get good delivery. Scrap turnings are shipped back to Cleveland for resale. The company finds shipping costs on completed parts are only slightly increased since moving to Florida.

Fringe Benefits Cost Still Climbing

▪ The cost of employee fringe benefits to U. S. industry continues to rise.

Management is learning that fringes have become a major collective bargaining matter and in some negotiations are even more important than wages. Probably no aspect of industrial relations has undergone greater change in recent years.

Cleveland Report—Latest report on increased fringe costs comes from the Cleveland area, where the Associated Industries of Cleveland made a survey of 174 companies accounting for more than 25 pct of the total hourly manufacturing work force there.

The survey showed that fringe benefit costs increased 11 cents a man-hour since 1955. That cost is now 49.50¢, compared to 38.54¢ in 1955—an increase of 30 pct.

Biggest Pay More—Bearing the brunt of the increase are large companies which employ more than 1000. They are paying out 52.62¢ a man-hour in fringe benefits, or 13¢ more than in 1955.

For medium-sized companies employing 101 - 1000 production workers, the cost rose to 44.72¢ an hour, an increase of 7.75¢.

Small companies employing 100 or fewer registered the least change. They doled out an average of 35.64¢ an hour in 1955 contrasted to 41.47¢ this year, or a 5.83¢ increase.

Setting the Pattern—Reason for the difference in fringe costs between big and small companies, according to AIC, is that larger firms are usually the first to grant new or additional fringe benefits.

More than 30 fringe benefits or wage supplements were used in the AIC survey. They included such items as bonuses, pensions, paid vacations, insurance, rest periods, and uniforms.

As a basis of comparison, at 49.50¢ a man-hour the cost of these benefits or wage supplements is nearly half the minimum hourly wage of $1 an hour.

Overtime Adds Up—The cost of fringe benefits varies in proportion to the length of the work-week, AIC points out. Until recently, the work-week had been longer than the 40-hour week usually considered standard.

If benefits had been figured on the basis of 40 hours, fringe benefit costs would have been higher, AIC said.

The survey also points up a considerable difference of opinion among companies over what constitutes a fringe benefit.

A few firms figured such things as dispensaries, employee publications, parking facilities, and employee discounts as fringe benefits.

Where Biggest Fringe Gains Are Made

	1955	1957	Increase
	per hour	per hour	per hour
Profit Sharing	.1120¢	.1720¢	.0600¢
Gifts and Awards	.0041	.0315	.0274
Pensions	.0869	.1142	.0273
Vacation Pay	.0851	.1083	.0232
Rest Periods	.0639	.0811	.0172
Insurance	.0418	.0536	.0118
Old Age and Survivors Benefits	.0638	.0729	.0091

Source: Associated Industries of Cleveland

Why Toyland Leans to Plastics

Metal Toys Lead, But Margin Narrows

The higher the price, the more likely a toy is to be made of metal.

Advantages of plastics in lower cost items result in greater volume.—By G. G. Carr.

• Plastics are crowding metals for front place under the Christmas tree this year.

Metal toys are still first in the hearts of the nation's 50-million kids, but plastics are running a close second. And the higher the price tag, the more likely the toy is made of metal.

Dad Pays—and Pays— Dad will shell out over $1.5 billion at retail counters for about 350 million toys this year, the toy industry predicts. Even allowing for inflation, Pop is doing better by his kids in '57. Last year, he spent about $1,334,000,000 for a mere 325 million toys. Continued prosperity has toymakers confidently predicting new records this year.

YOUNG SCIENTIST: This youthful chemist is typical of millions who will find advanced toys under their Christmas tree this year. New educational toys, new materials, point to changes in the toy metalworking market. But total toy market keeps growing. (A. C. Gilbert photo.)

Of the 350 million toys sold this year, more than 105 million will be made of metal. But 68 million will be plastic. And industry sources believe plastic's share is sure to grow, thanks primarily to the impact of Sputnik on space-minded moppets.

Advantages of Plastics—Plastics are being used in more toys than ever before, reports The Toy Manufacturers of the U.S.A., Inc. Durability, color and lack of toxicity have done the trick. Ease of cleaning is a boon to mothers.

Metal's market hold is strongest in the higher price brackets. About 13 pct of all toys sold this year will cost more than $5.00. Nearly 50 pct of these toys will be made of some type of metal. When Dad digs deeper, goes over $10 per toy, 68 pct are made of metal; only 9 pct in this range are of plastic. For all toys, other materials work out about 17 pct paper and cardboard, 10 pct wood, 9 pct rubber, 6 pct cloth, 10 pct miscellaneous.

Metal Users—By types of toy, biggest metal users are:

Earthmoving, farm and construction toys—78 pct.

Riding toys—80 pct.

Guns and accessories—78 pct.

Doll carriages and strollers—77 pct.

Metal is for the men, for reasons every parent knows. At all age groups, boys get more metal toys, while girls' toys stress paper, cloth and plastics. But there are fewer sex differences in toys for the 2-6 set, which receives 50 pct of all toys sold. Here, metal predominates for both boys and girls.

Going Educational — Too late for this year, but almost sure to be a bigger factor in the future is stepped-up emphasis on educational

and scientific toys, particularly for school-age children. Toymakers have been stressing the educational value of their products for years, have gone to considerable lengths to gear toys to learning processes.

Chemistry sets, microscopes and the like are old reliables for older children. Some large non-toy firms, like RCA, have already experimented with underwriting simplified build-it-yourself radio and electronic kits to spur young minds. Marketing and buyer education have been problems, but it's a safe bet that toymakers are studying them carefully.

Cloak and Dagger—Few secrets are as carefully guarded as a toy company's plans. The industry is fiercely competitive, and acutely sensitive to economic and materials fluctuations. A major headache is the seasonal factor. Despite hefty promotions, 70 pct of all toy sales are made in the last quarter, against Christmas. As a complication, the industry hires much skilled labor, which is hard to hold in slack times.

Despite its problems, the industry consoles itself by knowing that current high birth rates promise good business for a long time to come.

Per Family Quota—After that, today's high-volume nursery set will be buying toys for its children. And there is no reason to assume they won't do at least as well as their parents do by them.

That is pretty good, too. The average family spends almost $30 during the last quarter of the year for about nine toys for three or four children. The average child hauls in six toys for Christmas, with four from his parents and other close relatives.

Canco 1957 Expansion

Most of American Can Co.'s capital expenditures in 1957, which will total $52 million, were for new construction. G. W. Reese, vice president for manufacturing, said this outlay increased Canco facilities by 1.5 million sq ft.

Think Competitively When You Price

Setting the price for a new product? Be guided by the kind of market it will face, says an expert.

If new features permit, "skim" the market at good price. Where there's competition, price for deep market penetration.

▪ When you're pricing a new product keep in mind the kind of market it will face.

The key question to ask, says Joel Dean, pricing expert and head of Joel Dean Associates, Chicago consultants, is this: How fast will your competition catch up?

Skim If You Can—When product designers have come up with a unit featuring new advances it will probably be free from competition for a while, Dean points out. Also it can count on tapping a market where buyers consider advantages first and price second.

For these products, says Dean, a relatively high initial price is usually the best approach. A high price won't hinder skimming the cream off the market. And it can always be lowered later on if competition begins catching up.

The aim of such a "skimming" policy is a high sales volume early in the life of the product. It's based on two assumptions: Few directly competitive products, and an elite market for the product.

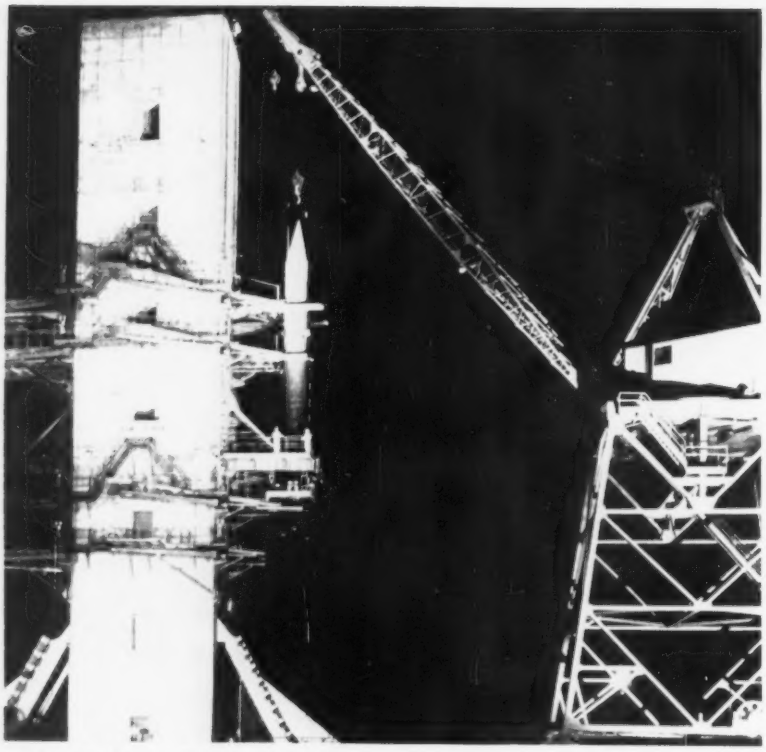
A uniquely new product usually has to pay off heavy investments in development and tooling. The high price permits rapid amortization of these costs. It also provides a cushion against hidden production and selling costs.

Or Go All Out—However, many products are born into a competitive market. For these, price is an important consideration with the buyer. The market has no cream to skim off. Here Dean recommends a "penetration" pricing policy. It aims at high unit sales volume with a lower profit per unit right from the beginning. To get sales volume and market penetration in depth the price must be as low as possible from the start.

Deciding Factors—Choose penetration pricing when: Price resistance will be high at all stages of product life. Where high-volume manufacturing means production savings. When competitive products will make an early appearance. Where competitors may use price cutting to counteract the new product's features. When there is no elite market to pay a higher price for these features.

Deciding which pricing method to use, says Dean, usually depends on five factors. These are: demand, cost, sales goals, promotion plans and distribution setup. Each must be examined carefully at all levels before price is set. Points easy to overlook are cost of investment capital tied up in the product and hidden production and sales costs. After all costs are determined it may turn out, Dean warns, that the market will be too small to make the product worthwhile.

Welcome Advice — This advice on price and competition was welcomed by those Dean addressed at the fourteenth annual meeting of The Materials Handling Institute. Along with other capital goods producers, they are feeling the current slowdown in plant expansion and the tightening in corporate budgets. Still—stressing the fact that their equipment is a prime cost-cutter for manufacturers—they are guardedly optimistic about sales.



MISSILE NEST: Test stand typifies growing outlays for missile buildup.

Why Defense Will Spark Economy

We are entering a period of defense inflation. This will become more and more evident.

Washington also is under growing pressure to prime economic pump. — By Eliot Janeway.*

• It has now become apparent that the Government is about to spend a great deal more money on defense—very much more than it has yet been willing to admit publicly. This is no longer news. What is news is the fact that, while the pressure on Washington to spend more grows more urgent by the day, business activity (and business psychology) continues to fall lower by the day.

In the past, arms inflation and commercial deflation have never gone hand-in-hand. Nor will they for very long—not if we are to do the job Russia has forced upon us. Specifically, businessmen and investors now bearish about the steel operating rate and, simultaneously, about the prospect of economic controls will be proven wrong on one count or another.

Controls Not Feasible—Controls are not feasible—economically or politically—when the steel rate is below 70 pct of capacity. If the present downturn in the steel rate and activity in general were allowed to continue, controls would be the least of our worries.

If, by the same token, defense inflation is about to hit the economy—as in fact it is—the outlook for the level of steel operations will prove to be the least of our worries. The prospect of controls will not become a real one until capacity operations are accompanied by shortage conditions.

No Question of Money—Meanwhile, the most pressing question now confronting the Administration and the country as a whole is not whether, or to what extent, or even how soon Washington will come up with the money needed to protect our national security and that of our allies. The question is, rather, how much work we shall manage to do with the money Government is about to spend and with the time our foreign bases and our strategic airpower are now buying for us.

Nowadays, the U. S. business trend is, increasingly, made (or unmade) in Washington. Just so, Washington must now depend upon business conditions for the answer to the question of how much defense we shall buy with the billions of dollars we are about to spend.

Prosperity "Weapon"—Our capitalist economy—unlike the Communist one—does not and cannot operate on the basis of government "rewards" if work is done efficiently and government "punishments" if it is not. Even in times like the present, when official "peace" is accompanied by a national defense emergency, our system can only offer rewards to those who are able to do the tremendous amount of work required. In order to be politically and militarily competitive with Russia, the reward our economy must offer is prosperity.

Needless to say, falling markets, falling production, falling income, and falling overtime and employment do not make for prosperity. Little wonder that the pressure is on the Government to effect a drastic change in its policy towards business and, therefore, in its own monetary policy.

*Economic Consultant.

About Face—Now that the Federal Reserve Board has begun to retreat from its tight money policy, the Government is about to begin repairing the damage already done.

But just as reflationary pressures from Washington begin to make themselves felt, a new wave of arms inflation will begin to hit the economy simultaneously—at a higher level of activity. The effect of this combination—the end of commercial deflation and the beginning of a new round of defense inflation—can be simply illustrated.

Commercial reflation alone would mean a recovery of some ten points in the steel rate; but the arms inflation that's coming on top of the commercial reflation already on the way will mean a return to the familiar shortage conditions which always accompany defense emergency. Admittedly, this seems remote at the moment. But it's no more remote than the emergency headlines now building up in Washington are from the financial page of the newspaper.

The Real Enemy—Now our primary problem is to protect the country against the growing threat from behind the Iron Curtain. This means that our economy will no longer be managed as though inflation, and not Russia, were our most formidable enemy.

Russia is our most formidable enemy, and will remain so for some years to come. And it is the rising pressure of competition with Russia which is forcing the drastic change about to be made in the Government's business and monetary policies.

Premium On Work—In any arms race — particularly such a long drawn out one as the present—the premium is on work, not money. The U. S. economy is about to be run—as it was in the 1940's and the early 1950's—for the benefit of those who are able to do the job confronting us. And the very "overcapacity" which has been the target of the Board's restrictive policies will now enable us to afford prosperity and defense as well.

How Do You Decide What To Buy?

A. O. Smith reveals its formula for deciding whether a new piece of equipment is a good buy.

It's a combination of a workable system, and seat-of-the-pants judgment.

After a purchase, records are kept to check cost estimates.

▪ Equipment acquisition formulas are valuable. But, it still takes some seat-of-the-pants judgment on whether a new piece of manufacturing equipment is a good buy.

A. O. Smith revealed its system at the Illinois Institute of Technology Productivity Conference. The rules can apply to both large and small metalworking plants.

Reasons for Buying—Why add a new tool? (1) Model changes in a product, (2) a new product, (3) normal replacement, (4) to reduce production costs, or (5) improve product quality. A. O. Smith codes each request for capital equipment dollars in one of these five categories.

Who suggests a new tool or process? Employees have provided a considerable number of suggestions. Most new ideas come from foremen and supervisors. Equipment salesmen are another fertile source. A. O. Smith liked the ideas from foremen and supervisors so well it arranged for members of both groups to attend the last Machine Tool Show.

Judging Ideas—Who eliminates the chaff and selects the heavyweight ideas? At each division, ideas flow through a cost reduction engineer, and the chief tool and process engineer. Winners go before a divisional capital spending review board.

The key to the A. O. Smith system is the capital request card. This is a proposal for capital expenditure by a division, coded, and assigned a priority. Briefly, the card describes what, where, how much, and why.

Keep Records—Divisional plant engineers maintain cumulative and spot totals of the maintenance costs in their plant. This provides plenty of data to guide the vice president for manufacturing.

Transfer of surplus equipment from another division or plant can eliminate some cards. Then total requests for all divisions are figured. This is balanced against the controller's forecast on how much will be available for capital expenditures in the year ahead. The divisional capital review board fits requests into available cash.

Work Ahead — In the A. O. Smith plan, an idea can come in anytime, but the overall work begins one year before the opening of the fiscal year in question. The company also requires that, when a piece of equipment is installed for manufacturing savings, quarterly reports must be submitted to determine the accuracy of the estimate.

There are more company equipment buyers today. A 1948 survey reported only a little over 24 pct of companies polled had someone charged with checking the economics of buying a new piece of equipment. Eight years later, 54 pct of the companies had an equipment acquisition analyst. The number of companies making periodic reviews of capital equipment to determine improvement or replacement needs has risen from 35 pct to 79 pct.

Layoffs Spread as Output Drops

Many Employees on Short Workweek

Over 8 pct of the country's steelworkers have been furloughed and many others are putting in less than 40 hours.

Cutbacks in production came as mills brought operations in level with incoming orders.

▪ One-third of the nation's steelworkers are putting in less than 40 hours a week. And more than 8 pct of them aren't working at all.

That's the assertion of David J. McDonald, president of the United Steelworkers. His summary on layoffs in the steel industry came as producers—facing a sluggish market—wrestled with the problem of further cutbacks. What Mr. McDonald says is not necessarily true, but there's no doubt that the industry has been forced to lay off workers, and to cut back on the work-week.

Back to Earth—The drop in steel operations came abruptly but its causes go back farther. In a market where buyers were dormant the mills were operating ahead of incoming orders. Finally came the realization that a readjustment was necessary.

Here's the production cutback picture by districts:

Cleveland — Mills in the Ohio area have been hard hit. However, continuous process mills in the area will probably continue working through this month. Cold metal shops are undecided. The breather would be appreciated. But they don't want to shut down and lose chances for fast delivery of orders. Many schedules in the hot rolling mills will be run off in the first three weeks in December. The final week will bring a holiday shutdown.

Pittsburgh-Youngstown — In the Pittsburgh area U. S. Steel has 25 out of 33 blast furnaces working. Only 7 out of 12 openhearth furnaces at Pittsburgh Steel are operating. The company says 10 pct of workers have been laid off. Allegheny Ludlum has 2 openhearths operating, 3 down. All 13 electric furnaces are off. Since last May about 2500 have been dropped from employment rolls at the company's Brackenridge Works.

National Steel Corp. reports all of its eight blast furnaces are operating. Jones & Laughlin indicates its order backlog is still 37 pct above 1954 levels. Both Republic Steel and Youngstown Sheet & Tube have been cutting back on openhearth operations in the Youngstown area.

Chicago — Steel mill layoffs are placed at about 4300-5000, although union officials put them at over 6500. They are increasing as mills fall below the minimum hours per employe allowed in contracts (32) and furlough workers.

Educated guesses on the number of workers on reduced work-weeks vary from 30,000 to 45,000. Rolling mills in the area are on 3-5 day weeks. About 75 pct of steelmaking furnaces are operating. The number of blast furnaces going, 31 out of 45, is also about 75 pct of the total.

Detroit—Great Lakes Steel Co. expected to lay off about 500 mill workers by the third week in December. Another 300 to 400 will probably be let out in the near future. Detroit Steel Corp. reports cutbacks in its hourly work force of about 1000 last August. Since that time the employment picture hasn't changed much.

Jones & Laughlin's Stainless Division started cuts as far back as last January. Since August above 1000 have been idled with no new or recent layoffs.

Philadelphia—Bethlehem Steel is going to close down its Steelton rolling mills and openhearths for two weeks from Dec. 22 to Jan. 5. Maintenance operations are a factor in the move. At the company's Lackawanna mill 21 out of 25 openhearths are operating, as well as all 7 blast furnaces. Production at Bethlehem and Sparrows Pt. is described as "good."

Alan Wood Steel Co. has eliminated all overtime. Plans to shut down plate mill operations for repair work have been deferred. Openhearth operations are at 72 pct of total capacity with 5 out of 9 furnaces pouring.

Steel Employment—A Falling Barometer

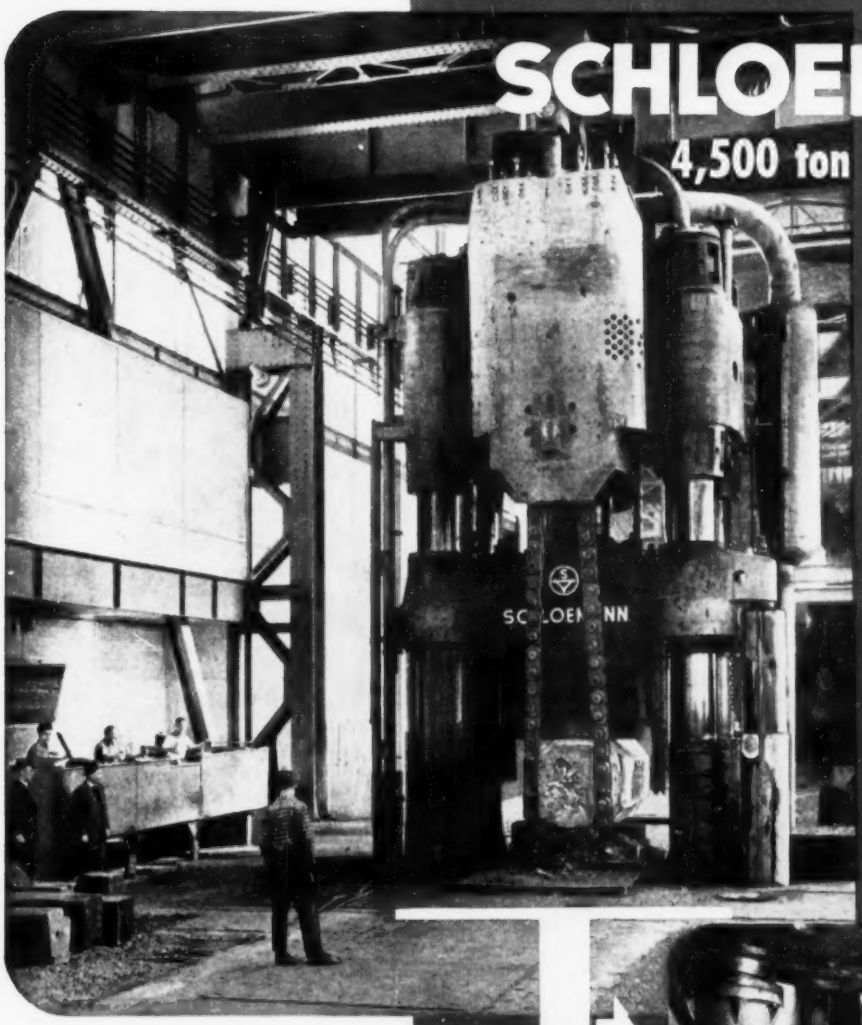
The number of hourly workers employed in the steel industry fell 7.4 pct between January and October of this year, according to American Iron and Steel Institute figures.

Over 39,000 fewer workers were employed in October, the AISI indicates, when hourly-paid employes totaled 491,000 as against 531,000 in January. There has been a drop in the number of steel industry hourly employees in every month since January, which was the high point of the year in employment. October employment showed a decline of more than 10,000 from September.

The average hours worked per employee has also dropped. The AISI reports employees worked an average of 38 hours per week in October, compared with 40.2 hours in January.

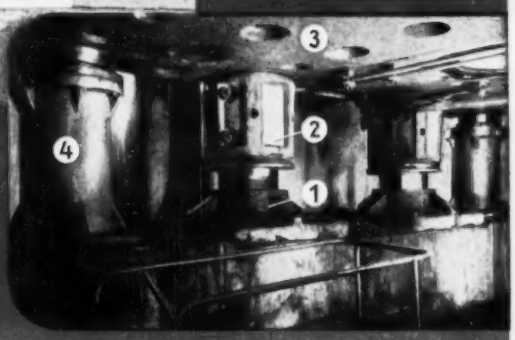
SCHLOEMANN

4,500 ton Forging Press



Support of the press on the foundation

1. shoe plate for column
2. column nut
3. entablature
4. support

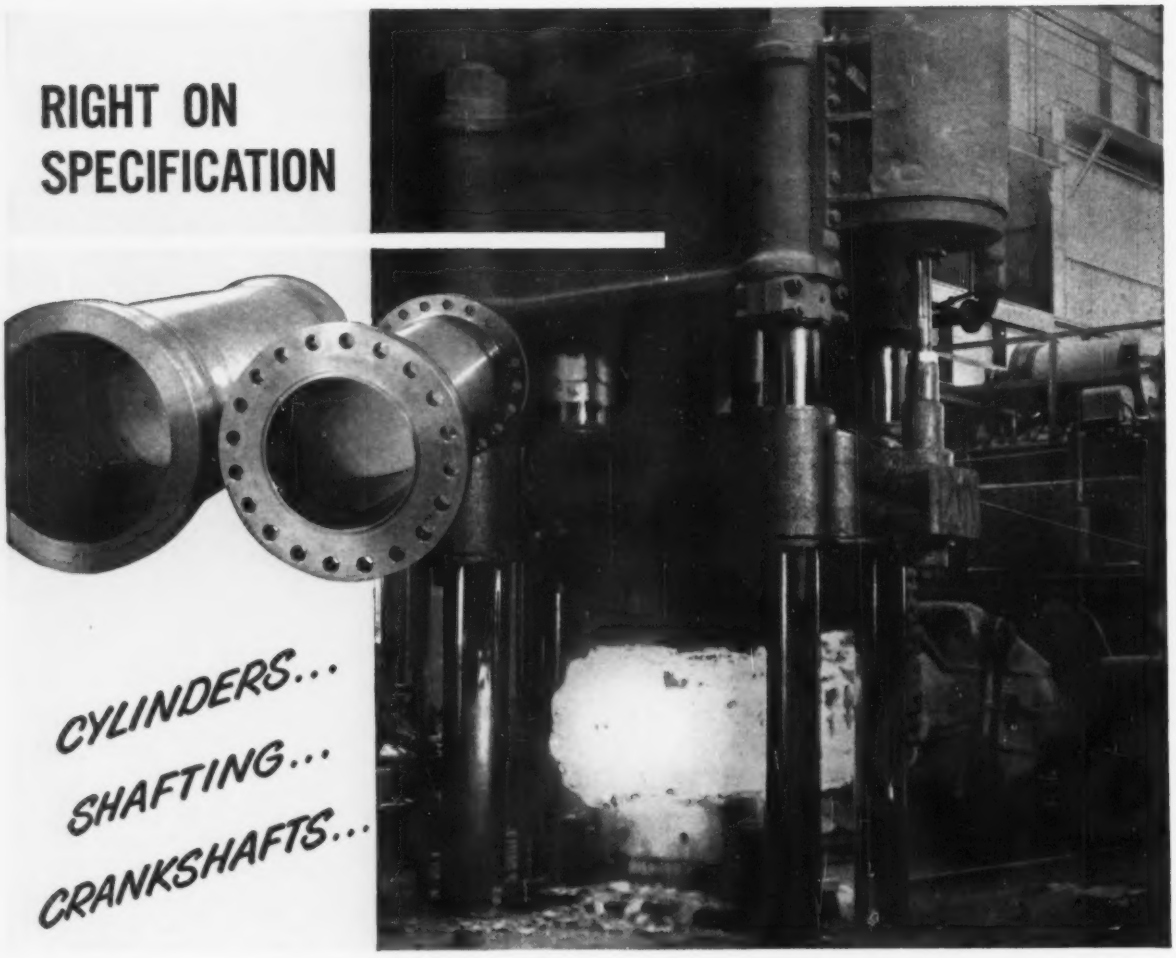


Electro-hydraulic controls • Rapid switching from normal forging to automatic planishing • Changing of pressure stages, working stroke, and speed of stroke during operation possible • Effective protection of columns from edging and bending effects during off-center work by spherically supported guide bushings in the moving crosshead • Particularly solid and rigid construction, no anchoring so that damage to the press foundation is completely prevented • *Further information supplied on request.*

FELLER ENGINEERING COMPANY 1159 Empire Building, Pittsburgh 22, Pa.

ROLLING MILLS FOR FERROUS AND NON-FERROUS METALS • COUNTERBLOW HAMMERS • HYDRAULIC PRESSES

RIGHT ON SPECIFICATION



CYLINDERS...
SHAFTING...
CRANKSHAFTS...

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Titusville Forge is accustomed to producing large and heavy forgings to exacting customer specifications for size, section, grain structure, heat treatment and finished machining. For broad experience on forgings of all sizes and complexity—capable facilities and good service, depend on Titusville Forge.

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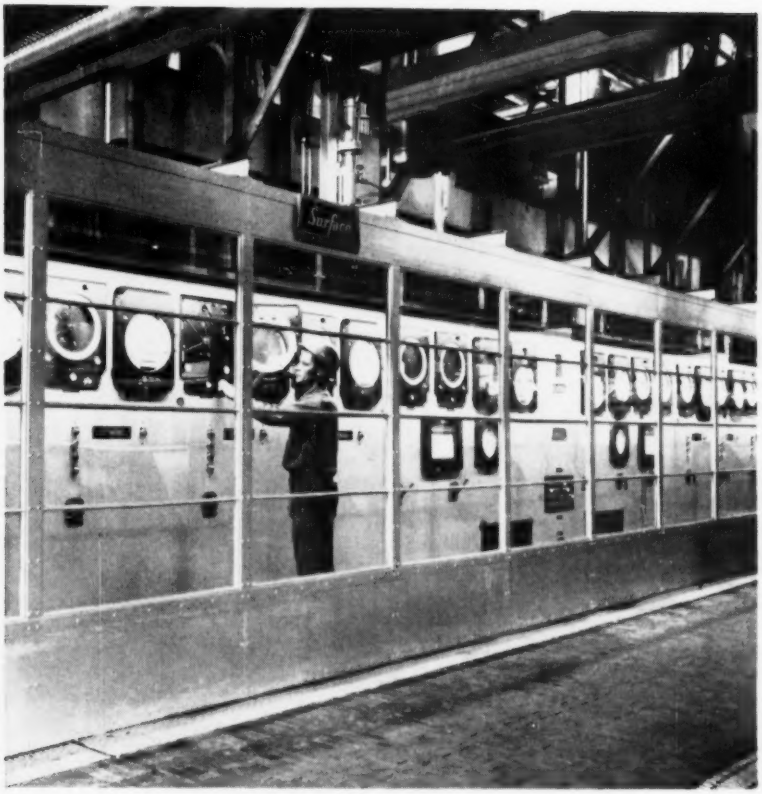
FORGE DIVISION

Crankshafts . . . Pressure Vessels . . . Hydraulic Cylinders . . . Shafting . . . Straightening and Back-up Rolls

STRUTHERS WELLS CORPORATION

TITUSVILLE FORGE DIVISION
TITUSVILLE, PA.
PLANTS AT TITUSVILLE, PA. AND WARREN, PA.
Offices in Principal Cities

More Steel in Time of Plenty



Republic Steel Corp. is putting the finishing touches on an expansion of its Cleveland plant, the biggest steel expansion in Ohio history. In the last two years capacity has been upped by 788,000 tons, to 3.3 million tons. Two new 375-ton openhearths were added, four others expanded. New 45-in. universal slabbing mill will roll ingots to 25 tons. Precise controls (above) on 16 new soaking pits heat ingots to 2400°F. Expanded approaches to the 98-in. hot strip mill permit straightaway rolling of slabs to 75 in. wide.

J&L Stainless Mill

Jones & Laughlin Steel Corp. will spend $16.3 million for a new stainless steel sheet and strip mill now being built at Louisville, Ky.

The facilities will be in renovated and new buildings on the site of the old Superior Sheet Steel Co.

New Equipment—Equipment includes a high-speed Sendzimir cold rolling mill, a continuous annealing and pickling line, coil preparation line, a 54-in. temper mill, three side strip and slitting lines, two shear-to-length lines for cutting coils to sheets, an inspection line, polishers, grinders and materials handling equipment.

The new mill will be able to turn out 36,000 tons of stainless annually. Gages will range from 0.012 to 0.005 in.

Production is scheduled to begin in the third quarter 1958.

Top Executives Land 5.1 Pct More Pay

Top American and Canadian executives got pay boosts averaging 5.1 pct in 1956, says the American Management Assn. This is off slightly from the previous year when top management registered an increase of 5.9 pct.

The AMA survey of 35,000 high ranking executives in 3800 companies pointed out that in comparison with other factors the top men actually did well.

Better in Comparison—In 1955 when they got a boost of 5.9 pct, sales were up 10 pct, profits up nearly 25 pct. Last year sales increased by only 7.8 pct, and net profits only 5 pct.

Non-durable goods executives got the lion's share of the increases. Compensation was up 6.2 pct on 7 pct more sales and 10.1 pct bigger profits.

Durable industries paid top management 3.1 pct more, for 5.4 pct increase in sales, and decrease in profits of 6 pct.

Includes Almost Half—Salary increases were granted to almost 49 pct of the executives polled.

Birthplace of Atomic Surface Ship

A basin 950 ft long, 450 ft wide and 40 ft deep was constructed by Bethlehem Steel Co. at its Fore River Yard, Quincy, Mass. The project cost $14 million.

The cavity will be divided lengthwise into three building basins by steel walls. The first ship to be built in the structure will be the world's first nuclear powered naval surface vessel—U.S.S. Long Beach, a cruiser.

Kaiser Oxygen Steel

In early February, an expanded Linde Co. oxygen producing plant near Fontana, Calif., will be ready to pipe high purity oxygen to Kaiser Steel's three new oxygen steelmaking furnaces.

By early summer Linde will be delivering 430 tons per day to the Kaiser installations at Fontana.

The oxygen steelmaking furnaces are a key part of the Kaiser expansion project, destined for completion in March.

P.M. of another good day

"Good" because this Inland Steel mill representative has just spent the day with a customer. Tired though he is, he's had the satisfaction of helping another steel user solve a knotty problem. That's his job—his and other Inland men like him who bring expert metallurgical knowledge to every assignment. They can help you select proper steels, establish specifications and may even suggest techniques to speed production, lower manufacturing costs. It's this kind of service that makes it good business to call on Inland for your steel needs.

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Dean E. Wooldridge

Man Behind Missile Electronics

No newcomer to the field, Mr. Wooldridge's record goes back to the first air-borne fire control system.

His company now has a vital role in the Air Force missile development program.

D. E. WOOLDRIDGE: A great future for systems engineering.

▪ In the light of recent missile tryouts, Dean E. Wooldridge, president of Ramo-Wooldridge Corp., carries on his shoulders some of the heaviest technical burdens of our day.

His company is responsible for systems engineering and technical direction of the Air Force ballistic missile program. Figuratively, Mr. Wooldridge is straddling an electronic keg of dynamite. Every time a button is pushed launching an Atlas or Thor missile, his professional prestige rides with it.

His Record—Pressure to "produce' is terrific on men such as he. Yet when you examine his record, Dean Wooldridge has been producing at a rate far above the average engineer for most of his life.

He is one of the best-known men in the growing electronics industry. Many of the nation's businessmen have heard him speak on the future of systems engineering and operations research in business and industry. His counsel is sought by groups concerned with the new frontiers of science.

Starts at Bell—His rise as an electronics expert began at California Institute of Technology, where he was graduated at the age of 23 with a Ph. D. in physics. He joined Bell Telephone Laboratories and for 10 years delved into electronics research.

During World War II he was in charge of work on the first airborne fire control systems. He was also instrumental in developing a strange new weapon called the Nike. By 1946 he was directing Bell's physical research program.

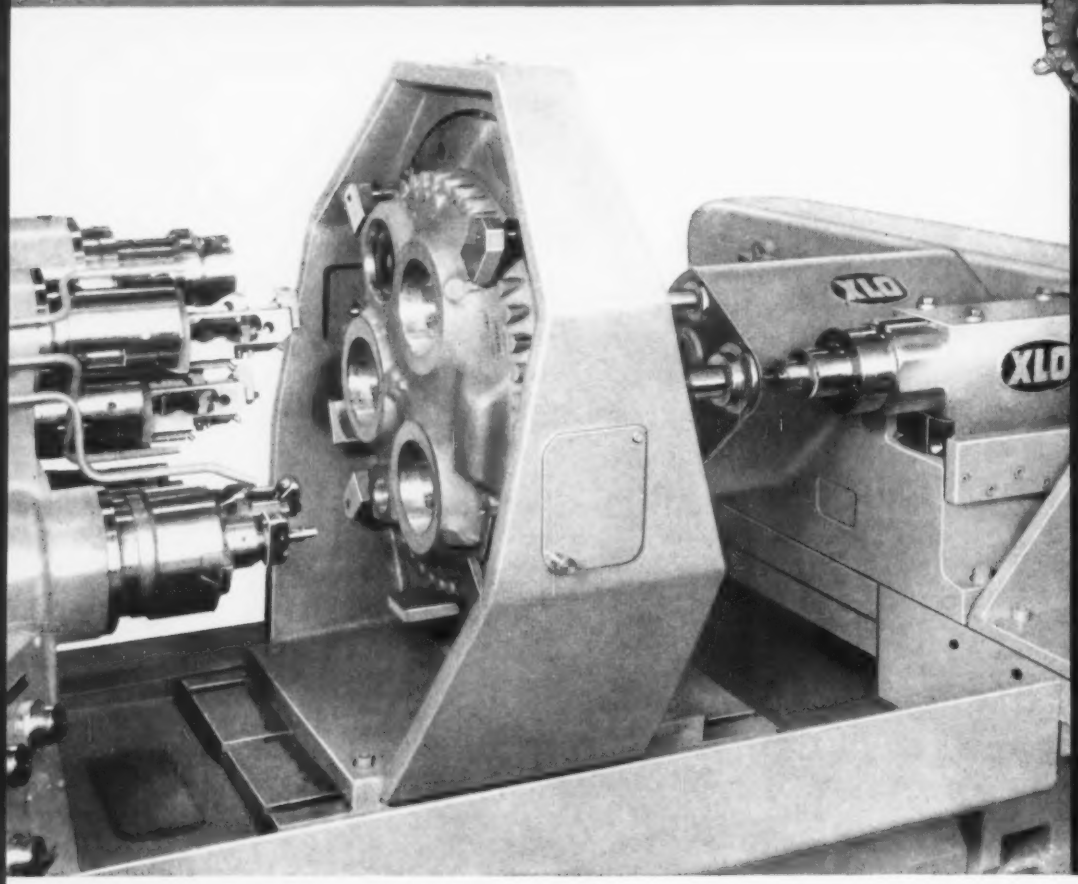
Joins Forces—A growing interest in the practical application of electronics prompted Mr. Wooldridge to join Hughes Aircraft Co.'s new electronics section. There he met Simon Ramo, director of the group, and the two men soon developed an electronic fire control system for the Air Force.

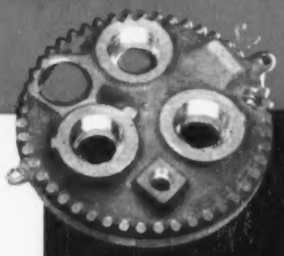
In 1953, Ramo and Wooldridge left Hughes to form their own company. They set out to solve some of the more difficult technical problems encountered by the military and industry. In four years, Ramo-Wooldridge Corp. has become one of the leading electronics research and development organizations.

Fellowship Established — While aid to education is usually the domain of larger and more mature firms, such is not the case here. To encourage young scientists and electronics engineers, Ramo-Wooldridge Fellowships are offered to graduate students for study in systems and operations research.

For his work in the field, Dr. Wooldridge received a Citation of Honor from the Air Force and the Raymond E. Hackett Award for 1955.

How to precision finish 42 surfaces in one cycle





Back and front view of the bored casting. Part will eventually house a precision gear train. All hole sizes and locations are held to .001" tolerances.

Close-up of part mounted in its hydraulically-operated fixture. Notice straddle facing tools mounted on boring spindles.

XLO
EX-CELL-O FOR PRECISION

57-70

These magnesium cast aircraft gear housings are being bored, faced and chamfered, 42 precision operations overall in one cycle on a single Ex-Cell-O 17-A precision boring machine! What's more, all diameters and locations are being held to .001" tolerances.

The ability of this and other Ex-Cell-O boring machines to perform multiple precision operations is recognized throughout the metalworking industry. This reputation, backed by years of leadership, is your assurance that precision boring is best done by an Ex-Cell-O machine.

For full information on the complete line of Ex-Cell-O precision boring machines, including the one best suited to your production standards, get in touch with your local Ex-Cell-O Representative. Or, if you prefer, write direct to Ex-Cell-O, Detroit.

EX-CELL-O CORPORATION — *Machinery Division*
DETROIT 32, MICHIGAN

MANUFACTURERS OF PRECISION MACHINE TOOLS • GRINDING AND BORING SPINDLES • CUTTING TOOLS • TORQUE ACTUATORS • RAILROAD PINS AND BUSHINGS • DRILL JIG BUSHINGS • AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS • DAIRY EQUIPMENT

Business Writers Look at 1958

An informal poll of financial and business writers shows mild optimism.

Some capsule conclusions: A slow first half in steel; an auto strike; higher steel prices.

▪ It may be that the record of many financial writers in recent months has had a close resemblance to a racing sheet's "Morning Line."

That's an exaggeration, of course, but trying to predict business conditions this year has been about as difficult as trying to buck the odds at the race track. So if your faith in financial and business writers is slightly shaken at the moment, it's understandable.

Informal Poll—Nevertheless, you should be interested in the results of an informal polling of leading financial and business writers that took place recently. In a way, it's a reverse twist to the usual procedure of business writers surveying business leaders. Because of the origin of the poll, emphasis is on steel operations, but other important economic areas are included.

The "experts" concluded (at least a majority agreed) that the steel industry will operate at over 70 pct of present capacity during the first half.

Early Speed — Emphasis is on **present** capacity. The industry's official ingot rate in 1958 will be based on capacity at the first of next year, and probably would be several points lower than a rate based on present capacity.

Majority opinion indicated a stable level of steel prices between now and June, 1958. Implication here is that even under hotly-competitive conditions, the price front is not likely to break.

Good Odds—The vote also indicated steel prices will go up after July 1, 1958, when automatic wage increases go into effect throughout the steel industry. On the financial side of the steel business, the financial writers could foresee little significant change in dividend policy. Majorities voted "No" on both increased and decreased dividends, but went along with "present level."

Slow First Half; Pickup in Last

Comes On in Stretch — On the broader side of business, the writers are pessimistic about first-half 1958, but more optimistic about the last half and the year as a whole.

Majority conclusion was that the Federal Reserve index of industrial production rate of October is not likely to be exceeded in the first half of 1958. For the record, that rate was 142.

Auto Strike Predicted—Most believe that some districts of the Federal Reserve Bank will lower discount rates in the first half of next year. Increases in corporate taxes are considered unlikely. But it is believed that Congress will raise the debt limit.

Most of the writers predicted an auto production rate that would result in less than 3.1 million cars in the first half of 1958. In other words, they believe the rate will be much lower than in 1957, when 3.373 million cars were turned out in the same period.

But the predominating opinion was that the auto industry will be hit by a strike in 1958, when the three-year labor contracts run out.

Construction Will Improve

One Bright Spot—One of the few brightening areas in business is the construction industry, where substantial improvements next year are indicated.

The joint conclusion of the Commerce and Labor Depts. is a 5 pct increase in expenditures over 1957, which itself is setting a new record for construction outlays.

Second in Volume—The 5 pct increase is expected to result in spending of $49.6 billion for new construction in 1958. The figure for 1957 will be about $47.2 billion.

In physical volume of work, this will make 1958 the second largest construction year. The record year is still 1955, in spite of the higher dollar rates of subsequent years resulting from higher costs.

More for Highways—Where will the increase in outlays come? Highway construction will be the big area, with a moderate increase in home building also forecast.

In line with the tapering off of industrial spending for new plants and equipment, the industrial construction area is expected to decline. Military spending for new facilities will also decline, says Commerce.

AUTOMOTIVE

Why the Auto Industry Stays Big

One Business in Six Depends on Its Production

U. S. consumers want cars. This, of course, is the basic reason why automaking is the nation's No. 1 industry.

But there are many other sides to the market you may be unaware of.—By H. R. Neal.

■ No matter how you look at it, the automobile industry spells big business—even outside its own specific field of production.

Some $5-6 billion worth of automotive products are produced yearly by U. S. industries other than the motor vehicle industry, reports the Automobile Manufacturers Assn. This represents a factory employment of about 330,000 persons. Add to it the 790,000 employed in motor vehicle, parts, body and trailer manufacture. It puts total automotive production employment above the 1.1 million mark. Back in 1899 only 2500 employees worked in auto factories.

One in Six—Thousands of companies are involved—suppliers of the auto industry and of the parts and accessories market. The data, however, are incomplete. Based on the recently released U. S. Census of Manufactures, it includes only those automotive products listed separately in the Census.

But one business in six depends directly or indirectly on the American automobile market. Of the 4,252,000 businesses in the U. S., about 706,000 are related to automobiles. This includes auto repair businesses, parking lots, drive-in movies, and motels, among the many others.

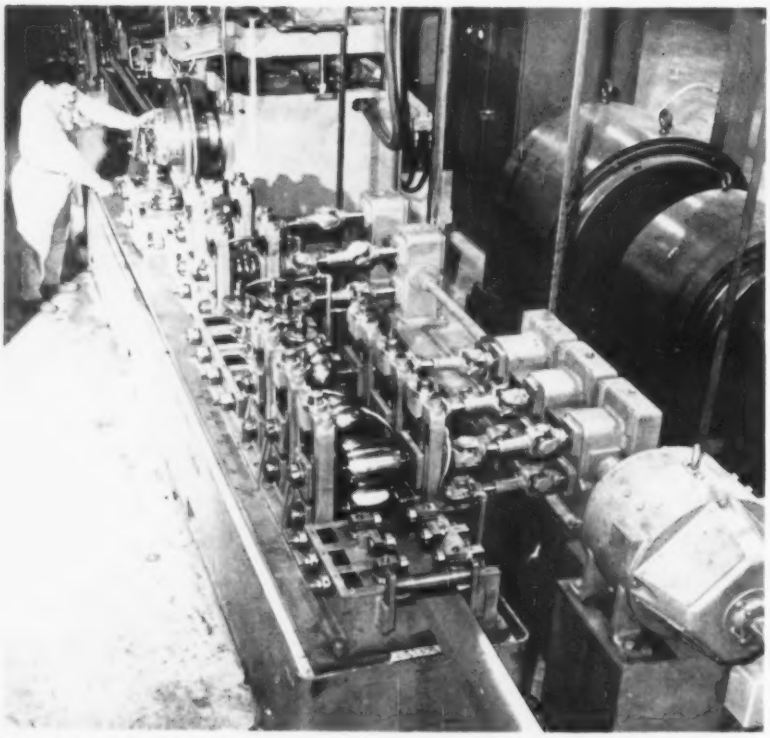
Registrations Up — The AMA estimates motor vehicle registrations in the U. S. will reach an all time high of 67,231,000. This is up 2 million from the 1956 record. It is well over half of the estimated 102,655,000 vehicles registered in the world in 1956. All of Asia has only about 2.5 million vehicles; Russia another 3 million. U. S. auto production in 1956 was 64 pct of the 11,675,203 cars produced in the world.

While there are 26 persons in the world for every automobile, there is one car for every 3.4 persons in the U. S., or one per family. There are 77,869,000 licensed drivers in the U. S.

Large Tax Bite—Another interesting fact. Taxes make up 24 pct of the delivered price of a passenger car today. Special taxes on motor vehicle uses reached a peak of $8 billions in 1956. Motor truck taxes alone topped $2.1 billions, which exceeded combined car, truck and bus taxes in every year prior to 1946.

Last year passenger car owners were able to go an average of 14.37 miles for each gallon of gasoline.

Supplying Tubes for Future Cars



EASTERN TUBE MILL: Equipment at new Motor Wheel Corp. plant in Newark, Del., has capacity of about 25,000 ft of tubing per 8-hr shift. Here, strip steel fed into a mill is formed, welded, and cut to length.

Bearings, Inc. service...this catalogue ...these plant men add up to big savings in bearing purchases!

Our Bearing Engineer was given permission by his customer to survey and compile a list of all equipment in their new plant. The proper bearings for each piece of this equipment were then catalogued. Shown above is the plant engineer, plant superintendent, and our sales engineer going over the results of his work. This catalogue shows application data on all machinery in the plant and lists the total number of bearings in the plant by size and bearing manufacturers' numbers.

It's now the "Bible" of the plant for bearing purchases and savings, since its completion, have been impressive!

Maintenance men now know the exact replacement bearing to requisition from stock. All bearings are correctly identified and are now ordered with the proper bearing numbers. Stocking several identical bearings for different machinery applications is *eliminated*.

We can perform this and many other services for *you*... For if it's a bearing problem, a call to our nearest branch will get you the answer!

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WEST VIRGINIA: Charleston • Huntington • Parkersburg • Wheeling • **NEW JERSEY:** Camden
NEW YORK: Buffalo, Balanrol Corp. • **MARYLAND:** Baltimore • **DELAWARE:** Wilmington

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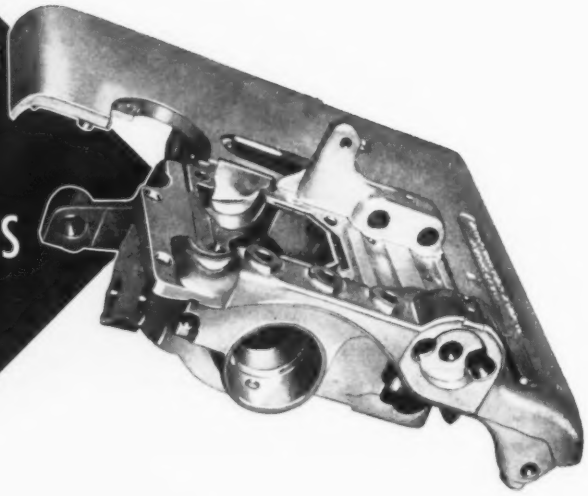
There's a Good Reason

WHY

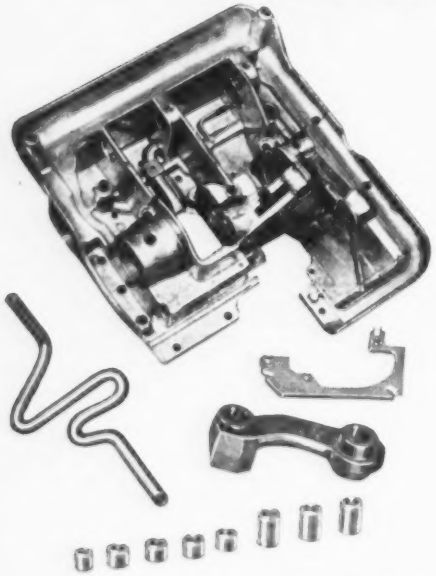
ZINC DIE CASTINGS

are so widely used –



at WILLCOX & GIBBS

it's COMPLEXITY



With eight knurled and threaded steel bushings, a steel bracket, a large, double, bearing frame, and a copper tube cast into the top frame as inserts, this is probably one of the most complicated ZINC Die Castings ever to come out of a die caster's shop. The result is COMPLEXITY with a purpose, and ZINC Die Casting takes complexity for granted.

This unbelievable complexity of shape was readily achieved in this sewing machine top frame through a single ZINC Die Casting. Willcox & Gibbs engineers incorporated features which would support dozens of critical parts to operate a mechanism moving at 5,500 rpm with incredibly fast starts and stops—and without vibration.

This rugged commercial sewing machine has to meet high performance demands for seaming, hemming, edging and serging operations at lightning-fast speeds—day-in, day-out utility—for fifteen years and more. Only ZINC Die Casting could provide these exacting requirements.

All sides of this top frame have numerous cored openings (the cores being pulled in four directions) that simplify assembly and help to make the "Superlock" sewing machine so efficient. There are many advantages in this ZINC Die Casting that may provide answers to some of your production problems. Send for our free folder "Zinc Die Castings" and then see a commercial die caster.

THE NEW JERSEY ZINC COMPANY 160 Front Street, New York 38, N. Y.

The research was done and the Zamak die casting alloys were developed with

HORSE HEAD SPECIAL (99.99 + % Uniform Quality)

ZINC

FOR DIE CASTING ALLOYS

Automotive Production

WEEK ENDING	CARS	TRUCKS
Dec. 14, 1957*	148,069	21,797
Dec. 7, 1957	139,506	22,588
Dec. 15, 1956	158,431	24,117
Dec. 8, 1956	167,576	24,091
TO DATE 1957	5,868,581	1,038,000
TO DATE 1956	5,551,199	1,071,487

*Preliminary Source: Ward's Reports

Total passenger car travel in 1956 reached an all-time peak of 507,615,000,000 miles and consumed 35,326,000,000 gallons of gasoline in covering the distance. The average mileage per car was 8,357 miles for the year on 651 gallons of fuel.

Fewer Cash Deals—The motorist who claims he doesn't get the mileage he did a few years ago is correct. But it is doubtful he could recognize the difference. In 1954 the average passenger car went 14.58 miles per gallon of fuel. This represents a decline of about one-fifth mile in the average between the years.

Cash purchases of new automobiles continued to drop. In 1956 only 34 pct of passenger car sales were cash deals. In 1950 the figure was 54 pct. The big break in cash purchases came in 1952 when cash sales dropped to 41 pct from 52 pct in the previous year. The peak for instalment purchases comes in the fall. From September through October, more than 75 pct of the customers used the 30-months-to-pay plan last year.

Small Cars Show More Gains

"Little" cars show further successes. American Motors Corp. said sales of its imported Metropolitan increased 71.3 pct during the first 11 months of the year. From January through November AMC dealers sold 11,452 Metropolitans, compared with 6683 for the same 1956 period, according to J. W. Watson, Metropolitan sales manager.

Ford International division reported its nine months registration figures for the English Ford line. Sales of Anglia, Prefect, Consul, Zephyr and Zodiac totaled 11,392 for the period. During the same 1956 period, 2515 of these imports were registered in the U. S. September registrations totaled 2073 cars, 1652 units ahead of September, 1956.

Plug Reduces Fouling

An auxiliary-gap type spark plug for use in engines particularly susceptible to oil and carbon fouling is being produced by Champion Spark Plug Co. Champion said the plug curtails oil and carbon fouling resulting from start-and-stop driving, prolonged idling, and low-temperature operation particularly common to local delivery trucks.

The principle in designing the auxiliary-gap types employs the use of an additional gap at the top of the center electrode. The firm said the gap causes a boost in voltage at the firing end of the spark plug which overcomes fouling. Champion's report pointed out present high output engines often use only a little of their full power at low speeds. Consequently, spark plugs don't become hot enough to burn off oil and carbon deposits.

DeSoto Sales Climb

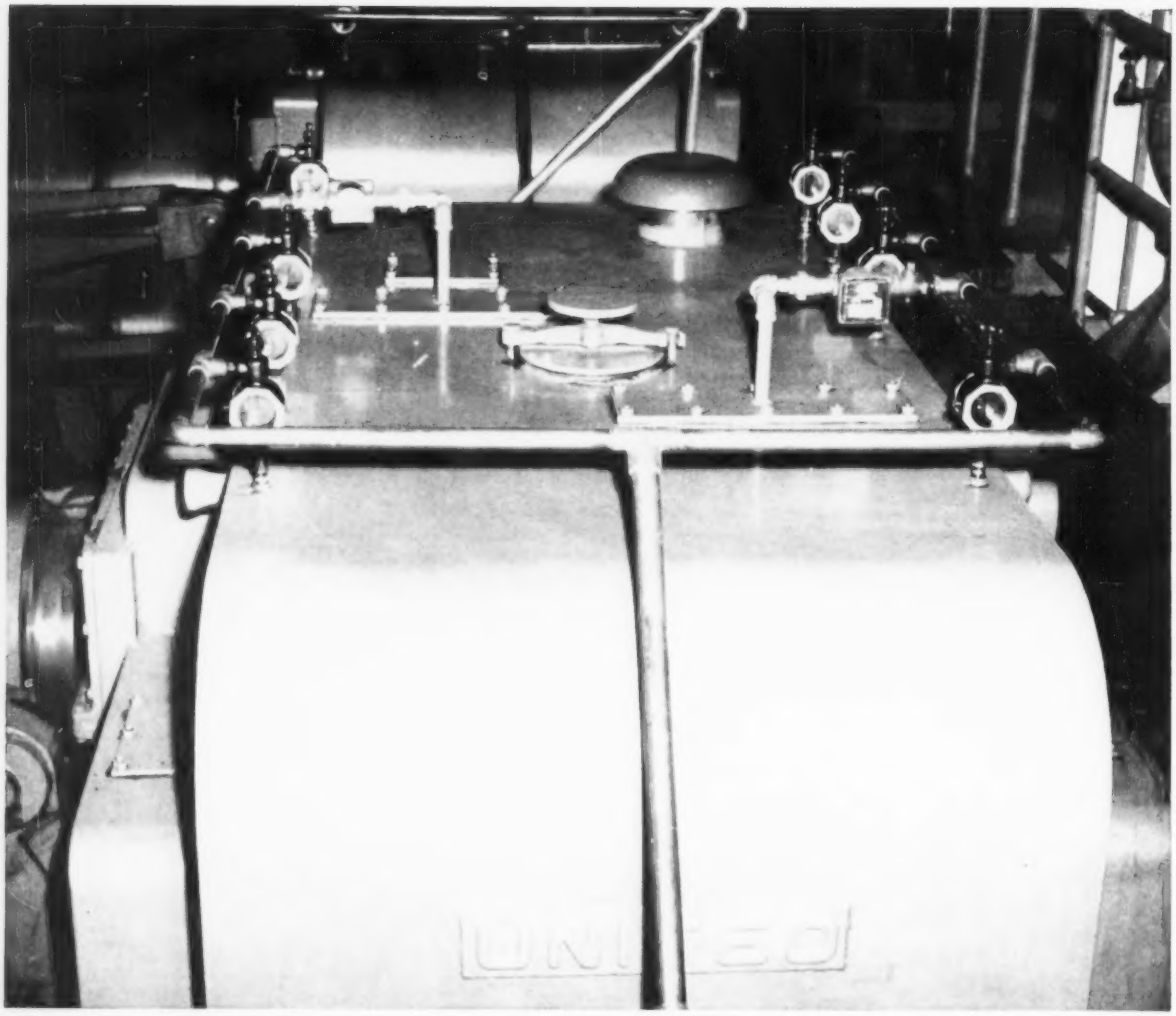
De Soto reports the 1957 model year was the third best in its history. J. B. Waggstaff, De Soto vice president, said the company shipped 117,326 cars during the model year. It is its third consecutive yearly increase in its share of the new car market. Since 1954, he said, De Soto has progressively increased its share of the market by 27.3 pct.

Ford V-8 Milestone

It took Ford Motor Co. a little over two years to build its first million V-8 engines. Today, 25 years and 9 months later, the 25 millionth V-8 engine will be produced in the firm's Lima, O., plant. The original V-8 engine developed 65 hp at 3400 rpm. It had a bore and stroke of 3-1/16 in. by 3-3/4 in. Piston displacement was 221 cu in. and compression ratio 5.5 to 1.

THE BULL OF THE WOODS

SAAY--YOU BIG MUSTARD PLASTER! YOU'LL BE HANGIN' OVER MY SHOULDER SOME DAY AND I'M GONNA REACH BACK AN' PEEL YOU RIGHT OFF--IN PIECES--YOU--YOU---
GREAT SCOTT! WHY, I BELIEVE HE'S ACTUALLY BAWLING OUT TH' BULL OF TH' WOODS! WH-WHY I DIDN'T THINK ANY-BODY COULD GET AWAY WITH THAT!
OH, YES, WE C'N ALL DO THAT--'AT'S WHERE WE GOT IT ON YOU OFFICE GUYS--WE CAN BAWL OUR BOSS OUT ALMOST TO HIS FACE--WITH ALL THIS MACHINERY ROARIN'!
WHERE YOU CAN TELL 'EM



How Texaco Meropa Protects Gear Drives Against Heavier Loads, Higher Speeds

The trend toward heavier loading and higher speeds means increased output at lower unit cost, but it calls for greater attention to lubrication needs. *Texaco Meropa Lubricants*, for example, designed for severe service conditions, are extreme pressure lubricants that cushion metal surfaces against wear, allow gears to operate smoothly. Special polar additives in *Meropa* effectively maintain a protective oil film during heavy shock loads.

There is a full line of *Texaco Meropa Lubricants*, whose high load carrying capacity exceeds all requirements of main drive units, and other steel mill machinery. Let an experienced Texaco Lubrication Engineer suggest the best ones for your conditions. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, New York.

TEXACO

TEXACO Meropa Lubricants

FOR STEEL MILL GEAR DRIVES

Why the U.S. Lags in Education

Many Schools Offer No "Hard" Courses

Office of Education study shows shocking number of schools ignore vital science courses.

Local school boards assigned the biggest measure of blame.

They went too far making school attractive.—By G. H. Baker.

■ An upcoming report by the U. S. Office of Education will show the nationwide slip in education standards is only partly due to the shortage of classrooms. Fewer required science courses—a situation widely tolerated by local school boards—must share the blame.

Sad but true, here's what the report will show:

20 pct of public high schools do not offer plane geometry.

33 pct do not offer intermediate algebra.

36 pct do not offer chemistry.

43 pct do not offer physics.

High schools offering neither trigonometry nor solid geometry enrolled 28 pct of all 12th-grade students.

The study, now being circulated privately among congressmen, is causing grave concern in both the Senate and the House.

What's Wrong? — Members of Congress are asking: What's wrong with our local school boards? In their zeal to make school "attractive," have they succeeded only in making it sterile for students of scientific bent? (Admiral H. G. Rickover, chief of Naval Reactors Branch, Atomic Energy Commission, cites as evidence the course offered by certain high schools called "How to Tell If You Are Really in Love." These schools offer almost no meaningful science courses, he says.)

Dollars alone are not the answer. The re-introduction of high school courses in mathematics, algebra, and geometry involves no expensive equipment, no special classrooms, no extra dollars for construction. The answer, unhappily, is that local school boards have become reluctant to require many (if any) difficult subjects.

The Road Back—Parent-Teacher Associations, too, are insistent on "easy" courses, educators report. Somewhere along the line a grave error has been committed. The road back to sound education will not be easy. But it's obvious that it is long overdue. If the United States is to catch up with Russian scientific progress, a return to "hard" education in this country is a must.

Tuition and Books—Some form of federal financial aid to education is taking shape. But it won't be as extensive as some have hoped. The aid to be voted by Congress is likely to be federal scholarships for promising youngsters, rather than outright grants for school construction.

Experts on scientific education say their most pressing problems are:

(1) Identifying talented students in scientific and engineering studies;

(2) Encouraging (by federal grants) these students to pursue their studies through high school and college.

Federal appropriations for schools, where granted, are likely to be for higher teacher salaries and grants for brighter students.

U.S.-Owned Machinery Use Probed

Subsidizing Charged — Charges that the government hurts small firms by subsidizing large defense contractors to the tune of billions of dollars a year may be aired in Congress next year.

Senate Small Business Committee investigators are getting ready to probe reports that government-owned plants, machines, equipment and even office furniture valued at $10 billion account for up to 80 pct of the facilities of major defense prime contractors.

Who Complains — Complaints have come from the West Coast aircraft subcontractors, the Strategic Industries Association of Los Angeles, the National Tool and Die Manufacturers Association, and several other industries, according to the Committee.

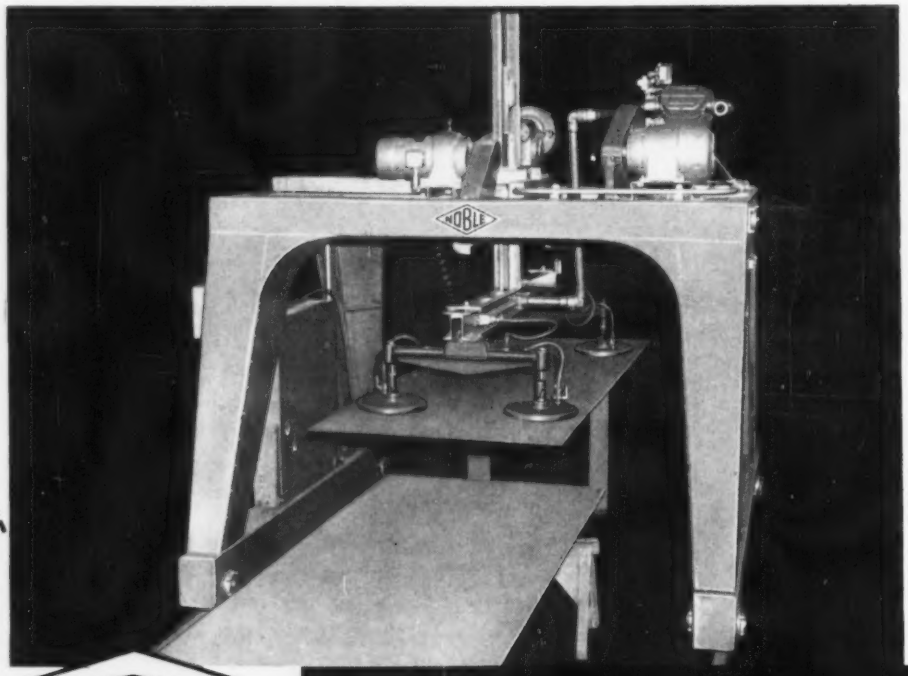
In one case, a prime contractor in the aircraft business is reported to have used a complete government plant since 1950 without paying any rent.

Hurts Competition—By providing free productive facilities, the military has supplied "the means to kill off competition from privately-financed independent suppliers," one group charges.

These facilities, according to the Strategic Industries Association, have put between 15,000 and 20,000 highly-skilled subcontractors in the defense-supporting metalworking field at a grave competitive disadvantage.

PROCESSING PLATE?

Get the production you're paying for



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Canada Wants European Funds

Aims for Less Dependence on America

Businessmen in British Columbia are wooing European firms about setting up branches in Western Canada.

With Canadian metalworking expanding on its own it means more competition for U. S. exporters.—By R. R. Kay.

▪ British Columbia is hard at work wooing European factories. Canada's big West Coast province is turning to Europe for capital expansion.

Canadian businessmen hope to get European industrialists to set up branch factories there. It reflects a growing feeling in Canada that the country should be less dependent on American capital.

More U. S. Competition—Meantime, there's still a big field for U. S. interests to expand into British Columbia. The economic future of the province seems apparent: Growth and more growth.

A word of caution: If you are now exporting to British Columbia, look for competition to get stiffer. The Canadians are doing well producing for themselves. Monthly lists of new and expanding firms are heavy in metalworking. And the widening range of Canadian-made products points to a firm economic base.

Good Metals Market — Natural gas, newly brought in from Peace River fields in Alberta, Canada, promises still greater industrial development. More workers mean more residents—all customers for metalworking products.

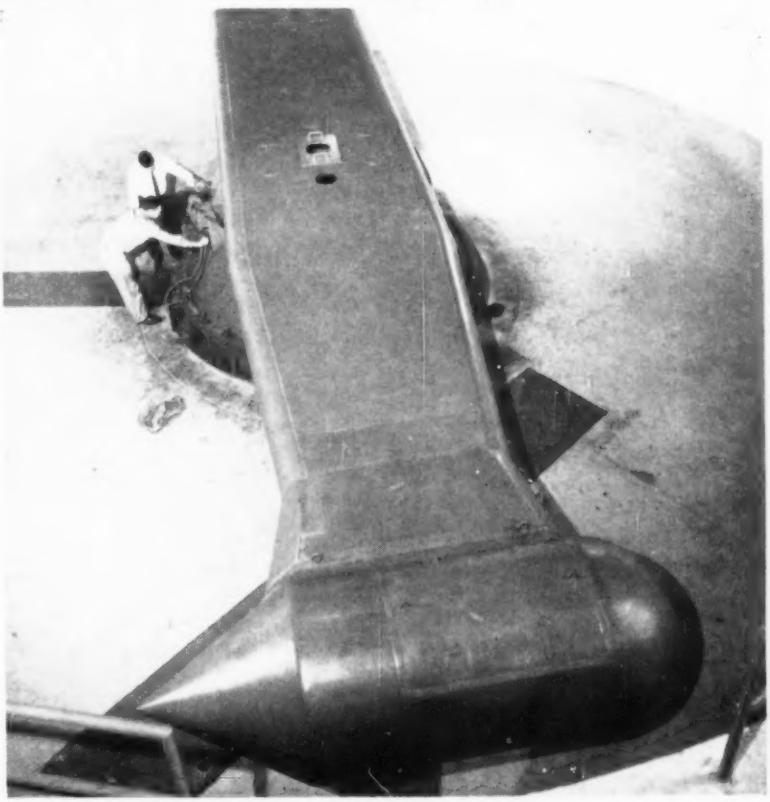
Another good sign for the region: Oil companies filed on over a million acres in British Columbia within the past few months. And drilling is underway by several firms in the Ferndale Basin on the B. C.—Washington border.

Take to the Water

California may become a major market for Washington State products ". . . as soon as we can develop low-cost water transportation." That's the opinion of H. Dewayne Kraeger, new director of Washington State's Dept. of Commerce and Economic Development. He foresees operation of huge barges between Washington and California ports as a means of tying the two regions even more closely together economically.

Everyone's In Act—Even Washington State's shipbuilders have non-marine products for sale. Todd Shipyards in Seattle, for example, fabricate large valves.

Dry Run for a Swing Through Space



THE BIG WHIRL: Huge centrifuge at Convair plant in San Diego will test components of the Atlas intercontinental ballistic missile. Items placed in compartment (front) can be whirled at 121 rpm.

Briquetting—Powder Metal Forming?

investigate CLEARING HYDRAULICS

Clearing engineers are at your disposal for help in selecting the proper press for your particular needs.

Deep, difficult draws, straightening, forming and hobbing—these are more conventional operations where Clearing Hydraulic presses also excel. We have some remarkable case histories on some of these presses—in fact, a wealth of information on Clearing hydraulics. Why not send for it right away?

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Numerical vs. Tracer Controls

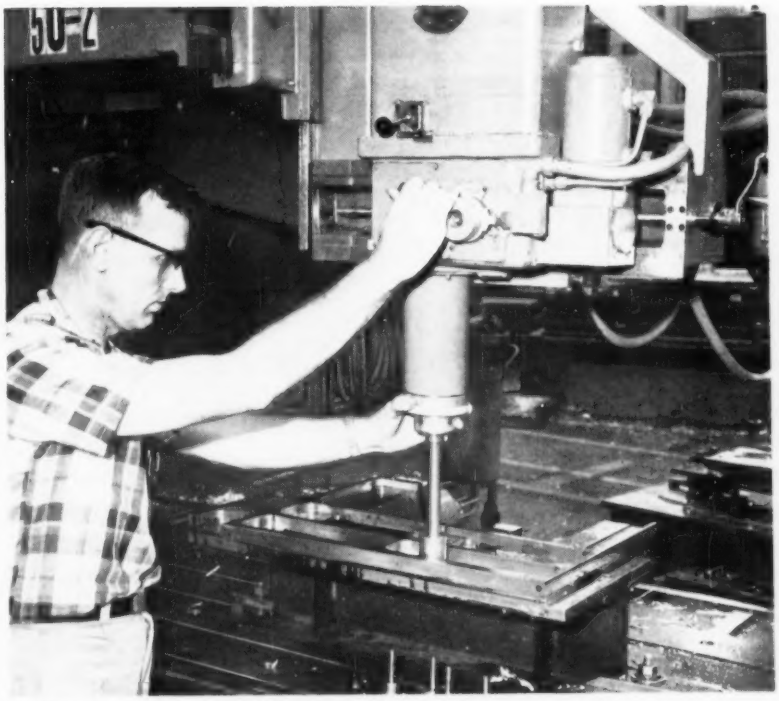
Douglas Aircraft Tries Both

Here is an objective comparison of these two methods by an aircraft company engineer.

Each will probably be used in machine shops for years to come.—By E. J. Egan, Jr.

■ The smart machine shop operator is apt to stay out of the hassle over which control system is best for machine tools—tracer or numerical. Realizing that neither has the final answer to every machining problem, he'll probably just sidestep the fight, buy one of each, and work them profitably on the jobs they do best.

An impartial analysis of how the two control methods stack up was offered recently by Carl B. Perry, plant engineering supervisor for Douglas Aircraft. He laid his no-axe-to-grind views on the line at the Third Annual Contour Machining Conference, in Los Angeles, sponsored by True-Trace Corp.



BEST CHOICE: Machine operator at The Martin Co. adjusts tracer control on a new Cincinnati Hydro-Tel milling machine. The firm also uses numerically controlled machines, depending on which does the job best.

Different Approaches—Both systems supply machine tools with the same two kinds of information, Mr. Perry says: (1) part-geometry data, and (2) machine-management data. Naturally, they do it in different ways.

A tracer machine uses a pattern or template to tell the cutting tool about part geometry. And it uses a machinist or machine operator as the input source for such machine-management data as: feed, speed, coolant flow, cycle starts and stops, pre-positioning of various machine elements, and other functions.

No Operator Needed—In a numerically controlled system, though, both types of information are fed to the machine from a stored intelligence source. Patterns or templates are unnecessary. Also, machine-management decisions are usually made on tape or punched cards before the workpiece and the machine tool ever meet.

Thus far in the comparison, numerical control would seem to win the debate hands down: no patterns to make, no operator to pull a possible boner and ruin an expensive piece of work.

But Wait—What if you need part models for other than machining? Many design-development programs do. So, if you need a model anyway, why not use it as a tracer template? Also, if templates can be made quickly and cheaply, why fuss with a data-processing system?

Then, too, if a contouring job is not beyond the skill of a human operator, why not let him manage the machine? After all, he can always stop it if there is a sudden, unpredictable response from the machine or the workpiece.

Looking far ahead, Mr. Perry thinks numerical controls will someday displace more tracer controls than the other way around. But in the well-equipped shop of tomorrow, he says, "you will find side by side the end products of technological evolution of two control systems, tracer and numerical."

INDUSTRIAL BRIEFS

Free Thinkers — The American Society for Metals has formed a "Free World Science Brainpower Pool" made up of the leaders of 20 free world scientific metal societies. It has invited the U. S. government to use the new group to step up its scientific programs. The pool will be limited to non-restricted aspects of metal science.

Ovens Off—Operations at U. S. Steel's Joliet Coke plant will come to an end March 1, 1958. For the past 20 years, it has been operating as a division of Gary Steel Works. The Joliet Works of U. S. Steel's American Steel & Wire Div., the other corporation unit in Joliet, will not be affected by the decision to cease operations at the coke plant.

Flat-Rolled Warehouse — The Berry Steel Corp., Kenilworth, N. J., has been set up to stock and distribute flat-rolled metal products. These include low carbon sheets and coils, cold rolled strip, stainless strip, sheets and coils, coated steel coils, and aluminized sheet and coils. Services include precision slitting, shearing and leveling. J. G. Berry is president.

"Hello Willis. I accept your proposal."

Four Score—Four Westinghouse Electric Corp. engineers have received $2500 each for developing a control system to permit production of strip steel at speeds in excess of a mile a minute. Honored were R. W. Moore, W. D. King, J. T. Carleton and L. F. Stringer. All are engineers. Citations pointed out the "creative, inventive thinking which has produced an outstanding invention."

Click for Cash—A top class prize of $500 plus a grand prize of $500 can be won by an industrial photographer in the forthcoming 11th annual Graflex photo contest. Ten cash prizes totaling $1375 and ten medal prizes will be awarded in each of five major classifications: news, industrial, professional, non-professional, and teen-age. Graflex, Inc., Rochester, N. Y., will accept entries from Jan. 1 to Mar. 1, 1958.

Bearing in Mind — A four-year science and engineering scholarship open annually to sons and daughters of employees has been established by The Fafnir Bearing Co., New Britain, Conn. Scholarship will be worth up to $10,000 and will be renewed yearly if the student maintains a satisfactory academic standing. Winners will be selected on the basis of character, scholastic record, and financial need.

Clinic for Castings — A Sales Training Clinic for all casting salesmen entitled "Techniques of Selling More Castings . . . Profitably!" will be offered by the foundry consulting firm Metallurgical Associates, Inc., New York. The series of one-day working sessions will be conducted in all major foundry areas throughout the country in 1958. The first clinic is scheduled for Jan. 21, 1958, at the Sheraton Hotel, Philadelphia.

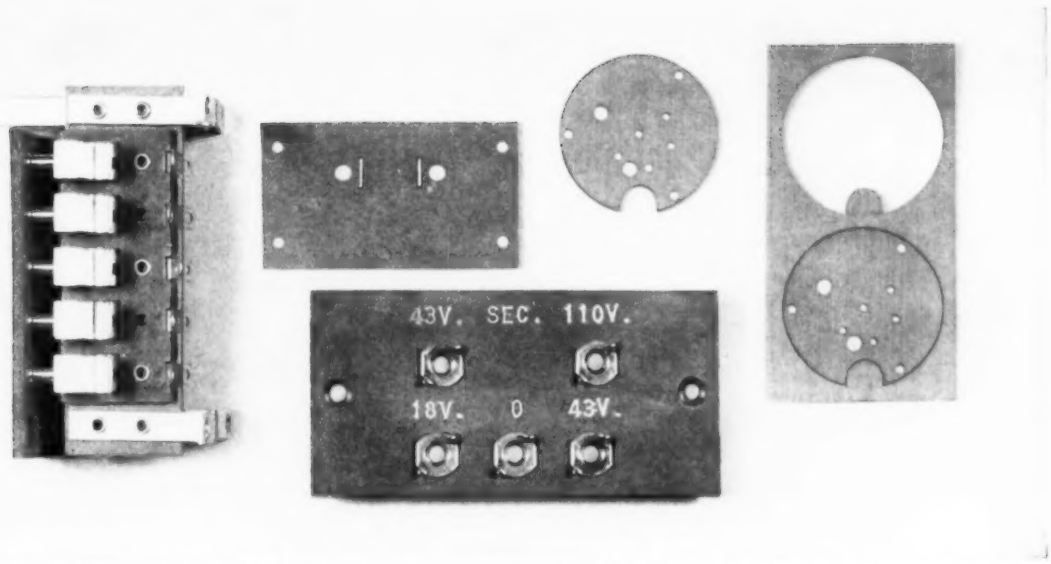
Collecting Stampings — Entries for the 1958 John Woodman Higgins Redesign Award are now being received at the Pressed Metal Institute, Cleveland. The award is for redesign of a part, previously made in some other way to be stamped. It is based on originality of design, successful production, and percentage of savings as compared to the former methods. The winner will be announced at the spring technical meeting of the Institute in March.

Happy Birthday—On December 11, U. S. Steel's Fairless Works marked its fifth anniversary of production. Fairless Works has produced over 6.7 million tons of ingots since Dec. 1952. Their products have gone to hundreds of customers in the eastern part of the U. S. and for the manufacture of automobiles, appliances, cans, pipes, reinforcing bars, and scores of other products including many items for national defense.

Big Order — Hooker Electrochemical Co. has ordered what General Electric claims to be the nation's largest silicon rectifier system. It will be installed in 1958 at the company's Niagara Falls, N. Y., plant. The high-voltage rectifier system, rated at 17,300 kw, is being manufactured by GE's Rectifier Dept., Lynchburg, Va. It will operate from input voltage of 13.8 kv. Hooker will use the rectifier system in the production of chlorine.

The Fleet's In—Inland Steel Co. has announced the closing of a record season for its Great Lakes shipping with the arrival of its last vessel at Indiana Harbor Works, the steamship L. E. Block. Lake vessels brought a record 8,246,000 gross tons of iron ore, limestone and coal to the company's Indiana Harbor Works. Inland's five vessel fleet operated at full capacity from the season's opening on March 31.

Aye on Buy—Peninsular Metal Products Corp., Ferndale, Mich., will acquire all of the stock of the George L. Nankervis Co., Detroit. The latter is a leading manufacturer of automotive and aircraft testing equipment. The Nankervis Co. would be operated as a wholly owned but independent subsidiary of Peninsular Metal Products. Personnel and policies of the Nankervis Co. will not be affected by the change of ownership.



LEADING MANUFACTURERS USE VULCOID. For a punched timer-switch part that operates in oil; for arc chutes in circuit breakers; for the insulation and structural part of an auto headlight dimmer switch; for a formed electrical switch part carrying 110-volt 60-cycle current; for a mass-produced, 110-volt light socket part—for these and many more Underwriters approved parts, CDF Vulcoid is an effective, economical insulation material—good where neither plain fibre nor plain phenolic laminate would suffice.

Fibre gives it high arc-resistance . . .
Aniline resin gives it moisture-resistance

CDF VULCOID

resin-impregnated vulcanized fibre

Vulcoid® is *different*. To the electrical properties of vulcanized fibre we've added the low moisture-absorption of an aniline-type resin with an unusual affinity for cellulose fibers—*all at low cost*. Excellent moisture-resistance (two to four times that of plain vulcanized fibre) helps stabilize Vulcoid's excellent electrical insulating characteristics. Its low cost makes Vulcoid a fine production material for applications of moderate electrical requirements.

Underwriters' approval. Vulcoid is approved by Underwriters' Laboratories as a material for the insulation of current-carrying parts in electrical equipment. It carries the distinctive red and blue thread marking of such materials.

Easy to work. Like vulcanized fibre, Vulcoid is readily drawn or formed into permanent shapes, punched, machined (see illustration above) at low cost. CDF fabrication facilities can give you production quantities of Vulcoid parts to your specifications.

Learn all the advantages of designing around low-cost CDF Vulcoid parts such as arc-deflector spacers, transformer and motor lead bushings, circuit-breaker and transformer barriers, knife-switch guides, transformer coil separators, instrument and contact panels, baseboard receptacles, etc. Ask your CDF man or write for new technical bulletin.

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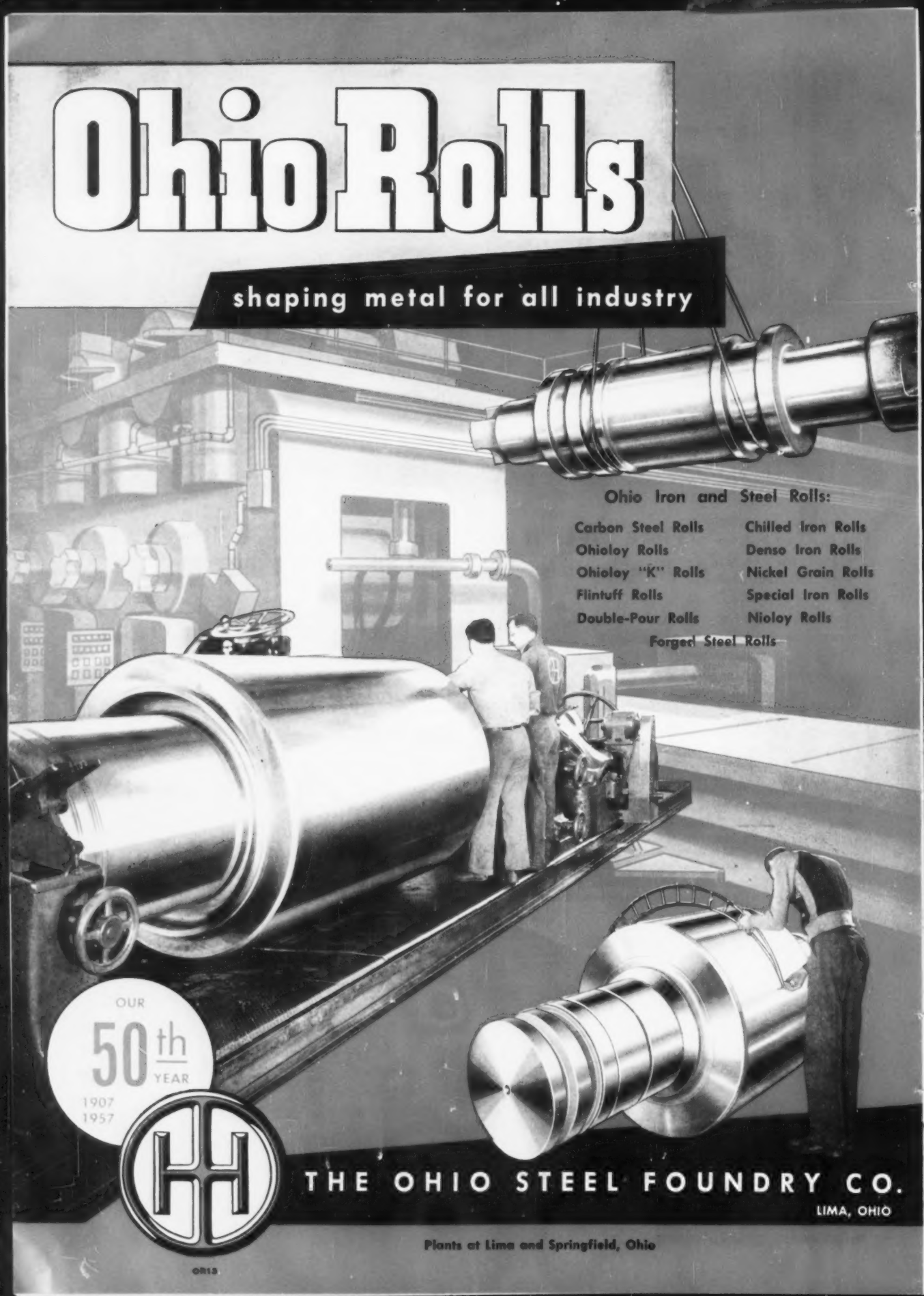
Property	Percent Normal Deviation	Commercial Vulcanized Fibre 1/16"	Paper Base (XX) Phenolic 1/16"	VULCOID 1/16"	1/8"	1/4"	1/2"	3/4"	1"
Arc Resistance, seconds	±25	140	4	110	110	110	110	110	110
Specific Gravity	±10	1.25	1.35	1.35	1.35	1.35	1.30	1.20	1.10
Moisture Absorption, % 24 hours	±25	60	1.4	30	15	6	4	4	4 8
Tensile Strength, thousands of psi. —MD	±25	11	12	12.5	12	11	9	8.5	5.5
CD			10	7.5	7.5	7	6.5	6	12
Flexural Strength, thousands of psi. —MD	±25	16	19	24	23	20	16	14	9
CD			17	19	17	16	13	11	60
Shearing Strength, thousands of psi. —MD	±25	8.5	14	14	12.5	12			
CD		8	12	12	11	10			
Compressive Strength, flatwise thousands of psi.	±20	25	34	36	36	36			
Izod Impact Strength (Edgewise) Ft. lbs. per inch of notch MD	±20	2.0	0.50*	1.2	1.2	1.2	1.2		
Dielectric Strength, Perpendicular to surface VPM	±20	175	700	475	425	275	170	100	

NOTE: ASTM test methods used for Specific Gravity, Moisture Absorption, Arc Resistance, Tensile, Flexural, Compressive, and Dielectric Strength.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Chilled Iron Rolls
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Plants at Lima and Springfield, Ohio
OR13

Wm. K. Stamets, Jr., elected president and general manager, The Enterprise Co.

L. W. Falk, elected executive vice president, The Falk Corp., Milwaukee.

N. E. Hathaway, elected director and vice president, marketing, Oronite Chemical Co., San Francisco.

E. L. Ilsley, elected vice president, Kaiser Steel Corp.

W. J. Smetak, elected president, treasurer and general manager, Wm. K. Stamets Co. and the Stamets Export Co. **H. R. Hanson,** elected vice president and general manager, Distributor Div., Wm. K. Stamets Co.; **A. H. Long,** elected vice president, engineering.

G. C. Saltarelli, elected senior vice president, Houdaille Industries, Inc.

R. G. Allen, elected executive vice president, Bucyrus-Erie Co., S. Milwaukee, Wis.

J. R. Walker, Jr., elected vice president and controller, Kaiser Steel Corp.

H. A. Kutscha, appointed manager, outside sales, reinforcing products, Chicago plant, Joseph T. Ryerson & Son, Inc; **R. E. Horter, Jr.,** appointed manager, reinforcing products sales, Cincinnati steel service plant.

P. R. Stolte, appointed administrator, Outboard Motor Div., The Oliver Corp; **A. W. Umbaugh,** appointed asst. to vice president, manufacturing.

M. H. Temple, named asst. manager, Richmond Plumbing Fixtures Div., Rheem Manufacturing Co.

E. P. Cunningham, appointed vice president, sales and administration, Clearing Machine Corp.

J. F. Gschwind, appointed vice president, development and research, The J. O. Ross Engineering Corp., New York.

S. W. Tisdale, named president, Southworth Machine Co., Portland, Maine; **G. F. Thurber, Jr.,** and **H. T. Hawkes,** named vice presidents; **R. D. Brace,** named secretary; **J. W. Jackson,** named treasurer; **T. S. Dyer,** appointed production manager, and **Gordon Braun,** named shop superintendent.

Walter Fleck, appointed manager, manufacturing and **Donald Denlinger,** as production superintendent, receiving tube plant in Bath, N. Y., Westinghouse Electric Corp.

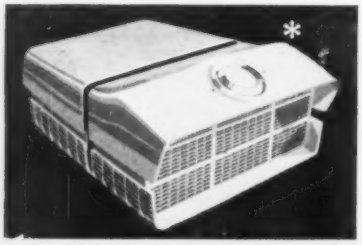
E. P. Sandbach, appointed chief metallurgist, Mackintosh-Hemphill Div., E. W. Bliss Co.

P. H. Daley, promoted to director, sales and **J. O. Phillips** to asst. manager, forging and die steel sales, Heppenstall Co.

T. W. Hunter, appointed general superintendent, Gary Steel Works, U. S. Steel Corp.

C. L. Liebau, elected chairman of the board, Federal Malleable Co., West Allis, Wis; **N. N. Amrhein,** elected president; **F. J. Huwiler,** elected vice president, sales; **T. F. Slattery,** elected vice

Idea!

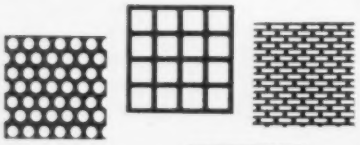


room air conditioning unit using H & K perforated metals

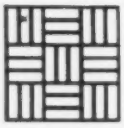
In the ¾ ton window air conditioner illustrated, perforated metals have been combined successfully with injection moulded plastics. The utilization, here, of new louvered perforated metals in adjustable frames on the frounced surface in combination with new embossed patterns on sides and under surfaces, afford rich tactile qualities hitherto unattainable in the air conditioner field.

Harrington & King perforated metals provide the Industrial Designer and other men of ideas unlimited opportunities to offer both functional and aesthetic properties as demanded in products for today's market. Contact H & K for your perforating requirements.

*Product Development by William M. Schmidt Associates



A few of the thousands of H & K perforated patterns. Illustrations are reduced in size.



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president and treasurer; **Thomas Tector,** promoted to general superintendent; **H. T. Hoak,** promoted to plant metallurgist, Metallurgical Div.; **H. L. Wintheiser,** promoted to supervisor, technical sales.

A. R. Collins, elected vice president, Stewart-Warner Corp., Chicago.

J. S. Pendleton, Jr., promoted to metallurgist, tool and alloy steels, The Carpenter Steel Co., Reading, Pa.

Dr. E. G. Loewen, appointed technical director, and **Franklin Meyer, Jr.,** asst. manager, Small Tool and Gage Div., The Taft-Peirce Mfg. Co., Woonsocket, R.I.

K. W. Connor, elected chairman of the board, Micromatic Hone Corp., Detroit.

J. I. Andreini, appointed manager, manufacturing, Bucyrus-Erie Co., S. Milwaukee.

J. J. O'Connor, promoted to manager, production planning, Stainless Steel Div., Jones & Laughlin Steel Corp., Warren, Mich.

F. Y. Walters, Jr., appointed manager, F. J. Stokes Co. of Canada, Ltd.

Carl Neisser, appointed manufacturing manager, Systems Div., Beckman Instruments, Inc.

C. S. Brown, promoted to product development manager, Glascote Products, Inc., Cleveland.

D. S. Connor, elected president and general manager, Micromatic Hone Corp., Detroit.

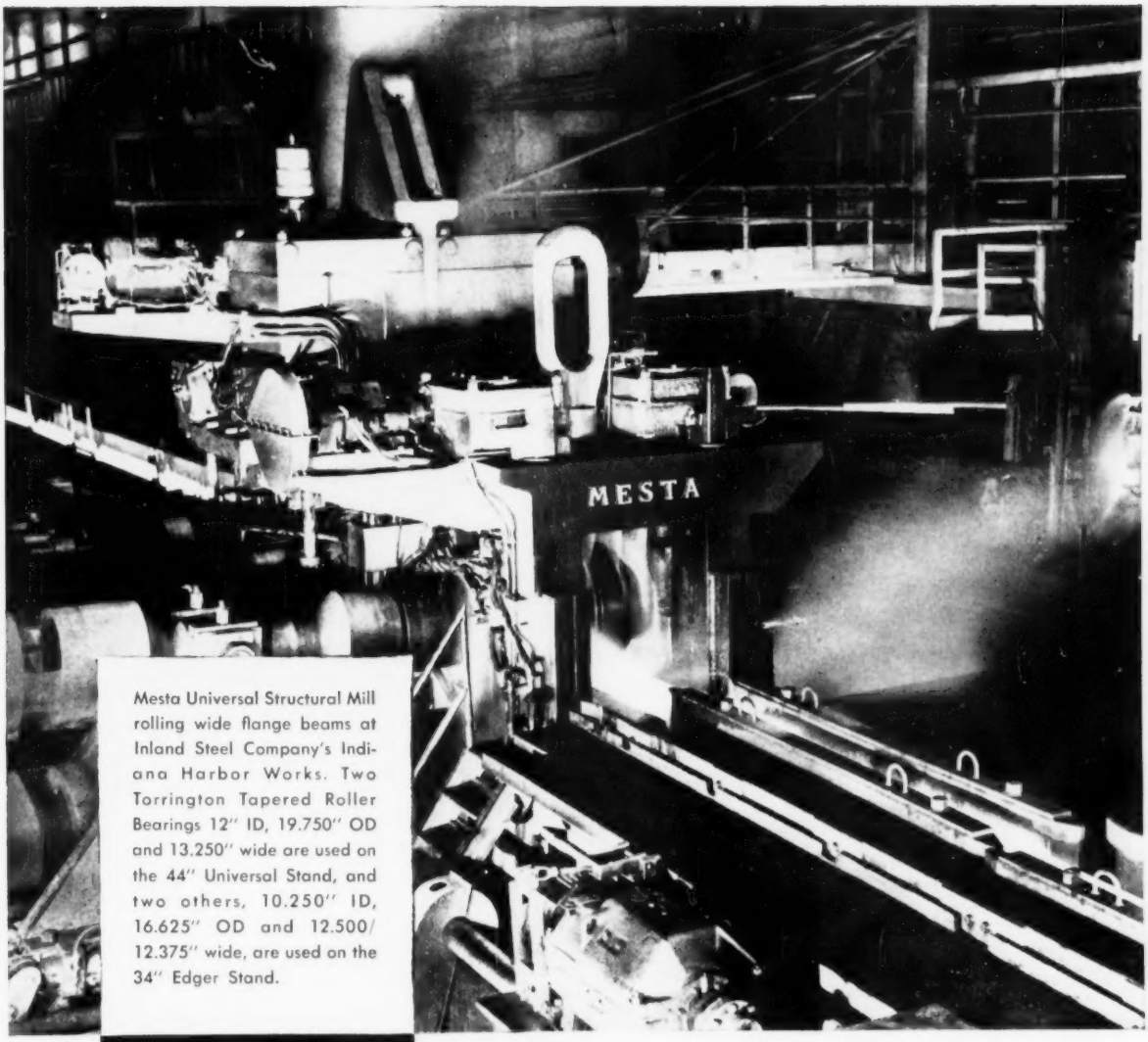
M. V. Kiebert, named proposals coordinator, Datalab, Div. of Consolidated Electrodynamics Corp., Pasadena, Calif.

H. M. Lawson, appointed manager, marketing, Medium Steam Turbine, Generator and Gear Dept., General Electric Co., Lynn, Mass.

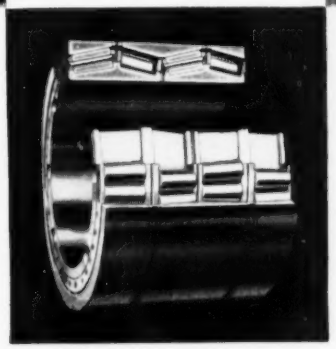
L. M. Henderson, appointed manager, finance and control, Steam Div., Westinghouse Electric Corp., Lester, Pa.

E. K. How, appointed sales manager, standard lines, Conduit Products Dept., General Electric Co., Bridgeport, Conn.

H. E. Thompson, promoted to New England division manager, A.



Mesta Universal Structural Mill rolling wide flange beams at Inland Steel Company's Indiana Harbor Works. Two Torrington Tapered Roller Bearings 12" ID, 19.750" OD and 13.250" wide are used on the 44" Universal Stand, and two others, 10.250" ID, 16.625" OD and 12.500/12.375" wide, are used on the 34" Edger Stand.



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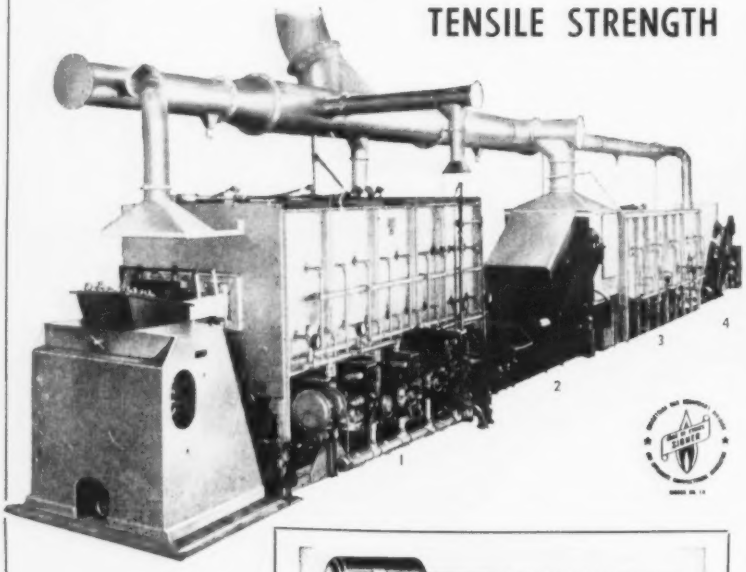

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M. Byers Co., Pittsburgh; **J. J. Merrill,** appointed Philadelphia division manager.

T. E. Walsh, appointed general sales manager, Plastop Corp.

D. W. Walker, named district manager, Philadelphia sales district, Kaiser Aluminum & Chemical Sales, Inc.

G. O. Eckley, appointed manager, insurance, United Air Lines.

Budrick Schindler, appointed manager, purchasing, AiResearch Mfg. Div., Los Angeles, The Garrett Corp.

M. T. Schimmel, appointed West Coast sales engineer, Conforming Matrix Corp., Toledo, O.

Following appointments are within the American Blower Div. of American-Standard: **G. T. Sonntag,** named sales engineer, Salt Lake City office; **J. R. Singer,**

appointed sales engineer, Los Angeles office; **R. O. Rose,** named sales engineer, Tulsa office.

A. J. Smith, appointed West Coast representative, The Lake Erie Machinery Corp., Buffalo, N. Y.

Frank Edwards, appointed plant superintendent, Ceramics Div., The Patterson Foundry and Machine Co., E. Liverpool, O.

J. H. Petersen, promoted to manager, The Geauga Plastics Co., Crestline, O.

R. J. Brown, appointed plant manager, Airtronics International Corp.

Ivan Calicoat, appointed manager, technical service, Dana Corp., Toledo, O.

M. F. Jones, appointed regional manager, packaging sales, South Central region, Reynolds Metals Co., St. Louis.

A. A. DeBlander, appointed superintendent, Canton, O., stainless steel sheet and strip mill.

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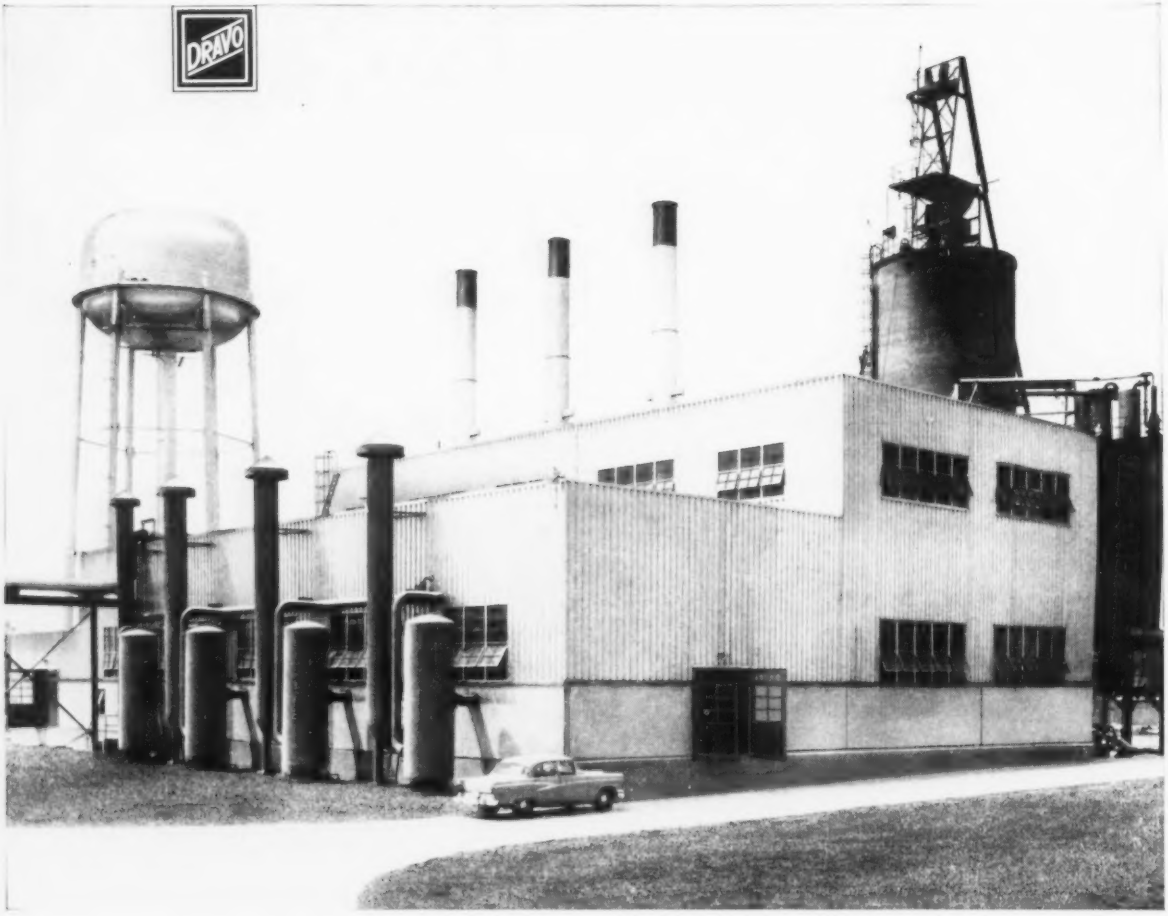

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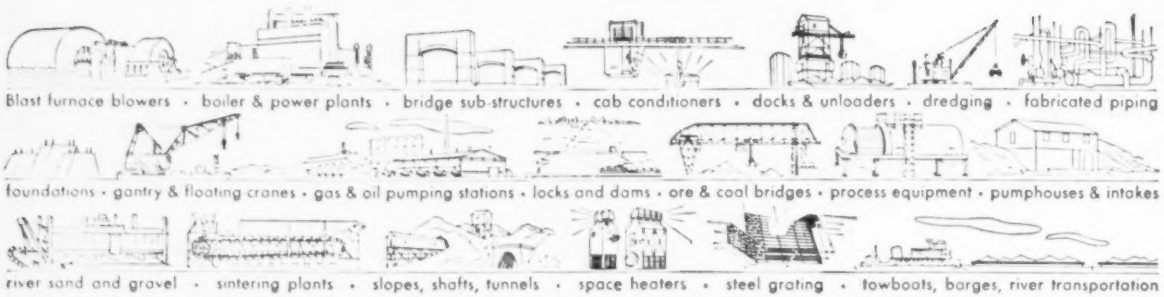

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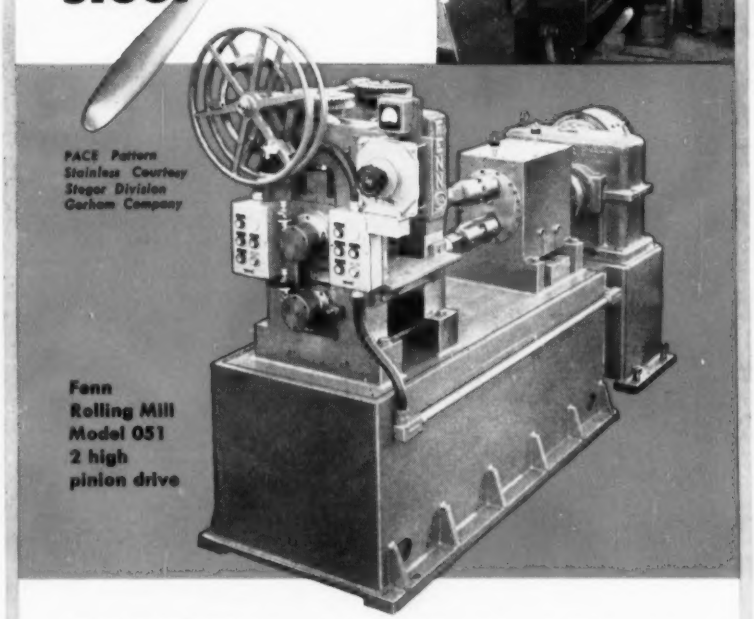
G. S. Diamond, becomes chairman of the board, Electro Refractories & Abrasives Corp. of Buffalo.

H. W. Stieglitz, elected vice president, engineering, Thomson Electric Welder Co., Lynn, Mass.

B. A. Bates, Jr., elected treasurer, Allied Products Corp., Detroit.

a pinch that pays on stainless steel



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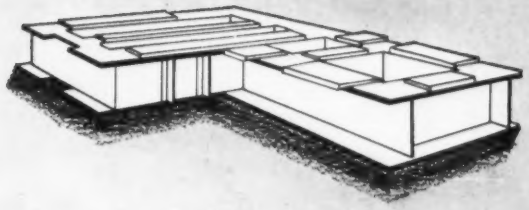

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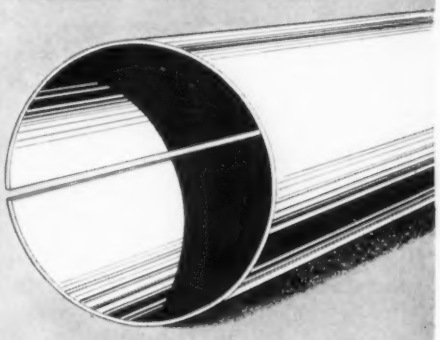

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Plant Modernization: Money Alone Won't Do It

By R. H. Eshelman—Engineering Editor

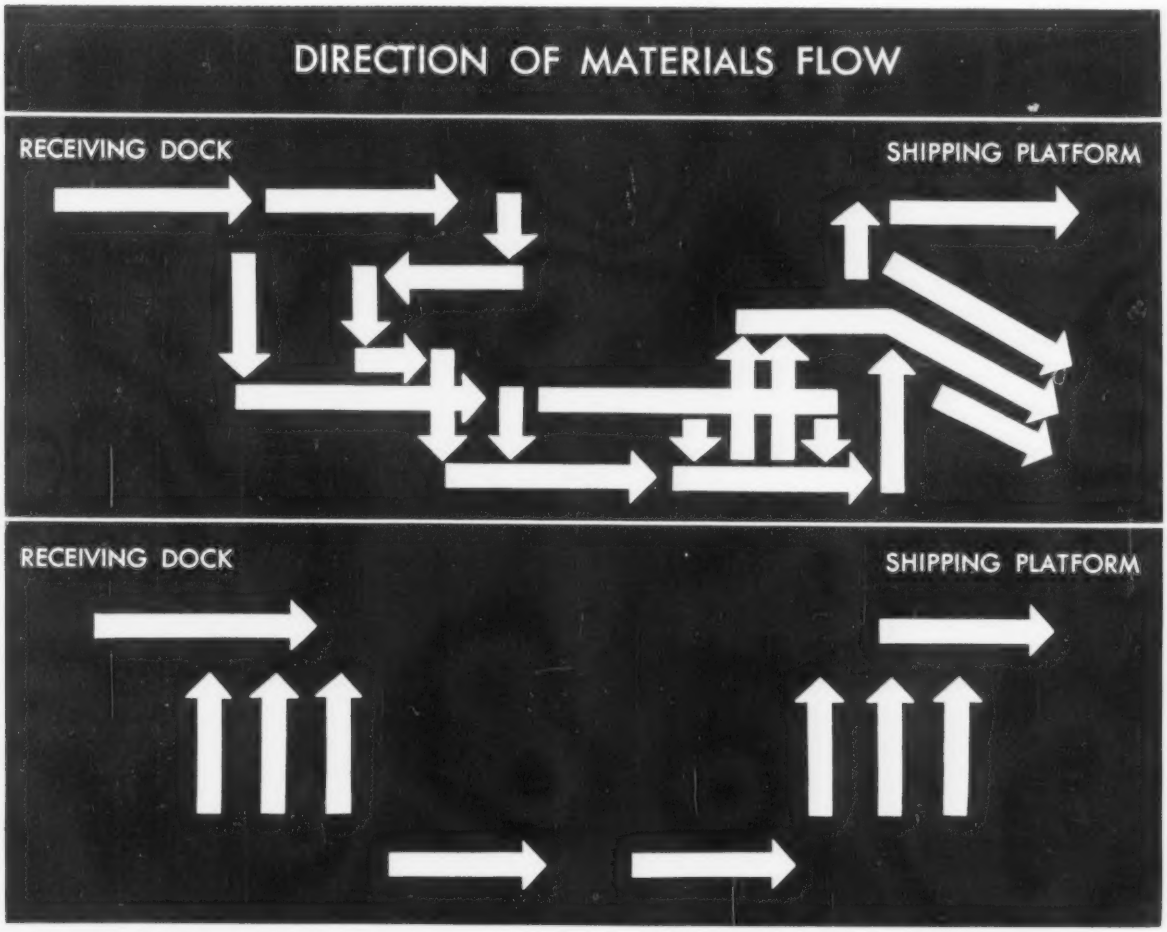
When smaller firms fail to reap top returns from plant modernization programs, there's a reason.

Often, it's materials handling that's overlooked. Some leaders in this field suggest ways to broaden your program and make it more effective.

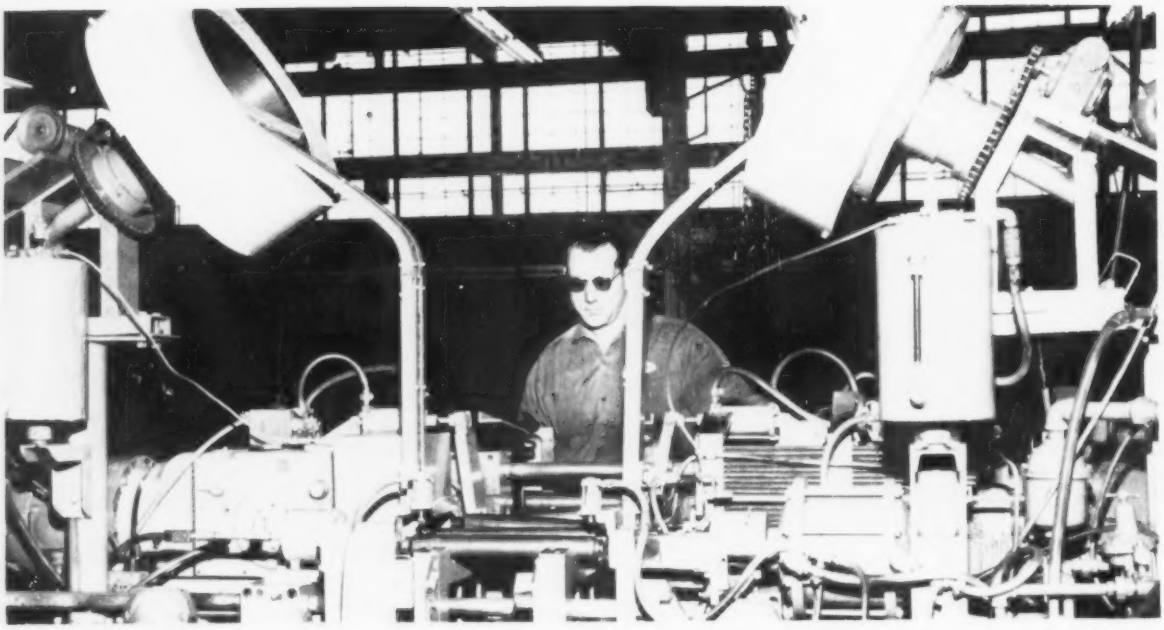
▪ Today's shrinking profit margins create a problem for many manufacturers. The industrial giants can tap money sources closed to smaller firms. Yet the latter must modernize their plants and improve their processes if they want to survive.

Sometimes it's possible to modernize without adding expensive floor space. For instance, American Seating Co., Grand Rapids, Mich., has a continuing program of plant improvement. One way it finds needed space is through better materials handling, new techniques in moving storage and use of overhead conveyors.

James R. Sebastian, president of the Rapids-Standard Co. of Grand Rapids, who has pioneered new materials handling ideas in his own plant, says "Our productive capac-



OBJECT LESSON: Poor planning jumbles materials flow (above). Rearranged plan (below) is better.



TIME SAVER: Better handling and storage isn't the only answer. Here, a double-ended machine automatically arc welds conveyor rollers, also helps boost production in the new Rapids-Standard plant.

ity has been increased 50 pct without adding space, manpower or machinery."

Why Modernize — Almost all firms that launch a modernization program have one or more urgent reasons, such as to add needed floor space, cut product cost, increase production, or add new products. Often it's just a matter of efficiency; the old facilities are uneconomic by competitive standards.

Whatever the reasons, when management decides to modernize, it has certain goals in mind. Unfortunately, these goals aren't met automatically by completing the program.

Sometimes there's too much emphasis on machines and too little on their organization. New facilities and a new plant do not guarantee increased efficiency.

Money's Not Enough — The experience of one medium sized firm is revealing. The president says, "Several years ago, we invested a considerable part of our net worth in a modern, one-floor plant, equipped with new automatic machinery and new tools. Many operations were moved from a crowded, multi-story building to this new plant, but without changing any other factors . . . In spite of the huge capital investment, we ended up with higher costs and lower profits."

No doubt this pattern has been repeated countless times by other firms. It indicates that the missing thread in many improvement pictures is co-ordination — management's efforts in one area must be followed through in all other important areas.

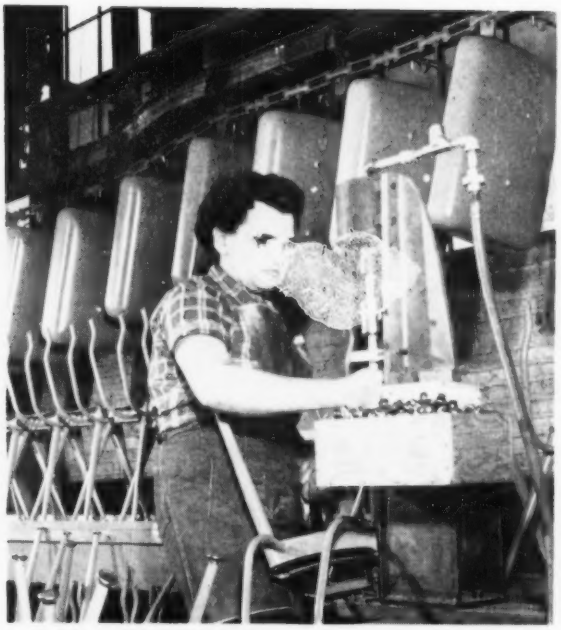
Management Problems—It's not easy to get the most out of a planned modernization program. There are several tough nuts for operating managers to crack. Where will the money come from? How many and what machines must be replaced? Will employees cooperate? Where should the program start? And, who should co-ordinate it? Can production be maintained without interruption? Can present workers be trained to use the new facilities?

According to James VerMeulen, executive vice-president of American Seating, their program for manufacturing improvements begins with the sales forecast. Because the firm's sales are seasonal, and especially heavy in the summer months, production must be scheduled well in advance. Improvements, then, are planned to dovetail with the sales picture.

Use Planning Aids—In looking for likely improvement areas, executives use both three dimensional models and floor plan type flow charts. In this way they can spot unnecessary movements and straighten work flow lines.

The problem of shorter, straighter flow lines leads directly to the question of materials inventories. Often the basic problem is one of storing work in process. Efficiency in automated lines demands a steady flow of work from one operation to the next. Static storage must not intervene once a part starts down the line.

These same principles, applied to small-lot production, can yield big gains in productive space and lower inventories. To get these benefits, management should ask: (1) Are we placing our raw materials in the best locations? (2)



PERFECT TIMING: Moving-storage conveyor for chair seats times their delivery to the assembly area.

Key Factors When You Modernize

1. **Shorten and straighten work flow.**
2. **Adopt first-in, first-out inventory control.**
3. **Store inventories at points of use.**
4. **Claim "air rights" with cube storage principles.**
5. **Use "live" storage to reduce handling effort.**
6. **Use perimeter feed; don't waste aisle speed.**
7. **Consider overhead conveyors.**
8. **Store bulk materials, small items in silos.**
9. **Save paperwork with machines, better forms.**
10. **Coordinate management's aims and efforts.**

Do we buy and store materials in proper quantities?

How Much? — It's a common error to pile up stocks of raw materials against any contingency. But with productive space at a premium, no plant can afford to be a warehouse for its suppliers. Why tie up a large part of working capital in raw inventory, unless real shortages exist?

To avoid these mistakes and still get faster conversion of materials to finished products, alert industrial engineers suggest "live" storage at the point of use. This requires that you determine exactly the optimum inventory to maintain any item. The right amount depends on size and frequency of production runs, timing and speed of deliveries and other key factors.

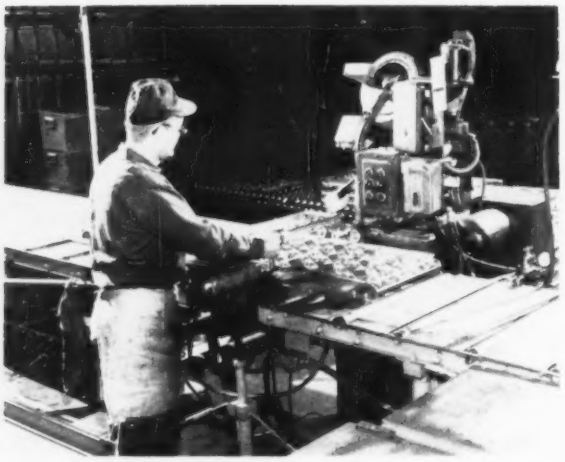
Materials and Work Storage — To carry this idea to a logical conclusion in its own plant, Rapids-Standard Co. uses flow type racks as materials "accumulators" around each production department. These hold both raw materials and work in process.

Reliance Electric's new plant in Ashtabula, O., also features this "point-of-use" storage extensively, along with roller conveyors. American Seating adds another item — the overhead rail conveyor — to benefit from otherwise unused ceiling space. Co-ordinating of such ideas in early planning stages can release a lot of central warehouse space for productive use.

According to Bert Woldring of Rapids-Standard Co., who developed many of these ideas, there are benefits in limiting your storage space. For one thing, inventories go on a first-in first-out basis, giving you better control. And you can cut your in-plant paperwork by having suppliers package and tag items for your convenience.

TRANSFER STORAGE: Roll-formed lengths go into rollerized, "live" storage racks conveniently spotted throughout assembly areas.

LIVE INVENTORY: Storing rotors on wheel-type racks simplifies stock control and production scheduling for Reliance Electric.



TRIPLE PLAY: Combination of roller conveyor, hopper feeder for nuts and automatic nut runner yields big gains in conveyor-assembly time.

Also, housekeeping is simplified.

Co-ordination Vital—A modernization program that delves into materials inventories, procurement methods, paperwork reduction, work standards and methods, sizes of production runs and plant layout involves a firm's entire technical management. Obviously it must have strong and active support from the top. Next it requires careful co-ordination of all efforts. This is a full time job. Often it's handled by an industrial engineer, backed up by the manufacturing manager.

Experience shows that financial, cost accounting and sales management personnel also have a vital stake in the success of such a program. Without full management support, the project may bog down over details or personality conflicts. Resistance to change is hardly ever confined to the lower ranks of employees.

Winning Employee Support—It's a well known principle of psychology that people fear what they don't understand. This applies particularly to their jobs. Production workers want to be "in on the know."

In its continuing improvement program, American Seating finds that employees are generally willing to go along with changes that must be made to meet competition. What's more, as the people closest to the job, they often make the best suggestions about such changes. In this way they share in the savings the program brings.

Foremen, supervisors, superintendents, methods engineers and other staff personnel are also given an incentive to get behind the program; the company shares some of the savings with them, too. This has sparked genuine interest and participation.

Training Essential — Although most firms find it best to make changes piecemeal, some retraining of production workers is nearly always needed. Usually it's not too hard to single out an area or department where the greatest gains can be made. But the more drastic the changes the more training required.

Automatic machinery requires a new approach from its operators. Scrap can be produced so much more rapidly than previously. And precision requirements are more exacting. Another item: The use of preprinted tabulating cards for job charges. They're handy for streamlined operations, but they may require explanation to overcome misunderstanding or even opposition.

Physical Side Important — By starting your study with the plant layout and movement of work through it, you avoid the danger of overstressing one phase of improvement. For instance, some experts feel that physical storage as such has been neglected in materials handling.

Proper use of storage can greatly reduce materials handling, but it involves study of the physical arrangement, facilities and physical movement. For example, silos outside the plant can often be used to feed small components automatically; this extends economic use of the cube principle.

Live storage on wheeled racks or conveyors will also reduce physical effort by workers, speed the flow of parts in process, and boost production. No matter how it's done, it's these three goals that any good modernization program seeks to achieve.

As one engineer put it, "The next few years will witness greater improvement in materials handling than has occurred for some time." The goals have been set. It's simply a matter of reaching for them.

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept. The IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

Prevent Electrical Failures: It Pays Its Own Way

By L. E. Johnston—Engineering Instructor, University of Wisconsin Extension Div., Madison, Wis.

Electrical equipment can run a long time without attention.

But neglect takes its toll in sudden breakdowns and inefficient operation.

It only takes a few simple rules to get long trouble-free service through preventive maintenance.

▪ A little time and effort spent on preventive electrical maintenance results in bonus performance and longer equipment life. Why? Because the very conditions that cause poor operation and costly failures are held in check.

It's a matter of knowing and applying the basic rules. Application comes in setting up a workable plan to fit the individual plant. This is a job in itself. Many manufacturers of electrical equipment have ready-made systems and forms.

First and Foremost—Electricity is dangerous if not handled with care. Even the most experienced electrical workers take the time to turn off the power in the line on which they are working. For extra safety, they remove the fuses.

With electric motors taking on more and more power demands, proper care should be routine. It's not difficult because 90 pct of all motor trouble can be blamed on any or all of four conditions: dirt, friction, moisture, and vibration.

Dirt Robs Efficiency — Motors working under the added load of dirt lose efficiency and are prone to failure. Blocked ventilating openings interefere with cooling. And dirt in the windings acts as an insulator.

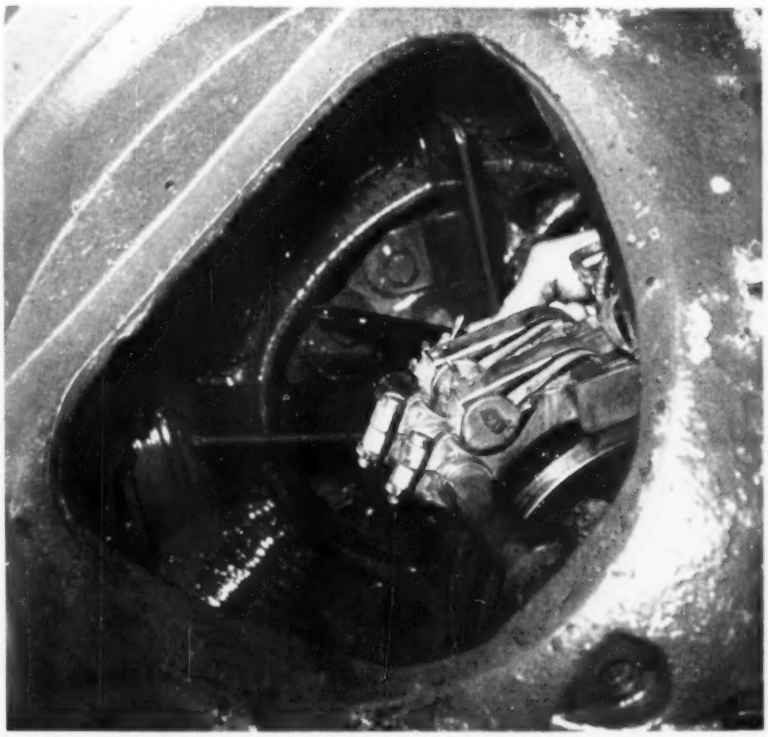
Glazed and gummy commutators and slip rings cause harmful sparking and increase resistance to current. Fouled bearings also cause unnecessary wear.

Periodic inspections and cleanings help to keep dirt in check. Covers and bell ends of totally-enclosed motors must be kept tightly fastened, and in extremely dirty locations, should be sealed with masking tape.

Open-type motors should be cleared of foreign matter with compressed air or vacuum. Keep air pressure below 40 lb or it will lodge dirt in the windings.

Where gum is present, benzine or gasoline solvents may be used to remove it. If the gum is stubborn, mix some carbon tetrachloride with the solvent. Straight carbon tetrachloride takes care of extreme cases. But avoid the fumes of this poisonous agent.

How to Lubricate—Load-carrying bearings need lubrication regularly. But too much grease or oil can be harmful. Excessive amounts foul commutator bars, deteriorate



CLEAN NOW, BUT: With open motors, dirt can blanket windings if not periodically blown out. (Westinghouse photo)

Rules for Safety

1. Never assume that a circuit is disconnected before working on it.

2. Adhere to proper electrical codes.

3. Don't skimp on time and materials at expense of a safe job.

4. Check and recheck every part of a wiring job for broken or worn-out insulation, loose wires, poor ground connections, and faulty equipment.

5. Never overload a circuit, or use a larger fuse than the circuit was designed for.

6. Learn the first aid treatment for burns and shock.

mica segments, or soak the windings to the breakdown point.

To get a true measure of oil for ring-oiled sleeve bearings, fill the housing when the motor is not running. Follow manufacturer's instructions in choosing type of oil. If instructions aren't available, a good SAE 10 or 20 machine oil is a safe choice.

Ball bearings should be lubricated only with high grade ball bearing grease, never automobile chassis grease. Don't fill the bearing housing over two-thirds full. Too much grease promotes friction and heat.

Moisture Can Damage — Improved varnishes and other insulating materials have minimized moisture damage in recent years. However, these materials are not a cure-all. Acid and alkali fumes can penetrate the toughest protective coats.

When moisture gets in, insulation breaks down, causing short circuits, current leaks, and decreased efficiency. Open motors should be kept dry, and standby motors should be run at least once a week to guard against condensation.

Vibration Shortens Life—Excessive vibration causes breakdown. Parts shake loose, connections break, and frictional wear increases. Check motor for loose mounts, misalignment, settling, worn bearings, and excessive belt tension.

In order to keep tabs on each of the four points of maintenance, those responsible for motor maintenance should keep records of inspections and corrective action. The frequency of inspections will vary with use. A motor in continuous service should be thoroughly checked every four months. Semi-annual checks are adequate for motors in intermittent service.

Don't Forget Controls — Quite often, a planned motor maintenance program overlooks controls, such as manual or magnetic starters, drum controllers, relays, and circuit breakers. Why bother? What could possibly go wrong with these things? But many troubles attributed to motors can actually be traced to control mechanisms.

One of the most obvious causes of trouble is the spot picked for mounting. Heat effects operation. Moisture causes corrosion and breakdown. Avoid locations over radiators, in bright sunlight, or in moist or corrosive atmosphere.

Vibration and changes in temperature loosen connections. A loose connection generates heat through increased resistance. Oxide forms, creating higher resistance and more heat. The cycle results in ultimate failure.

Make periodic checks to tighten connections. At the same time replace frayed or corroded shunts.

Look at Contacts—Oxide coating often forms on copper contact points if they aren't operated frequently enough to clean themselves. Dirty contacts should be cleaned with sandpaper or a fine file, but never with emery cloth or paper. Take note that silver coated or plated contacts should never be cleaned. Silver oxide is a good electrical conductor.

If more than one-third of original contact thickness has been worn away, or if pitting is extreme, contacts should be replaced, but always in pairs. Some roughness is normal and makes just as good a connection as if perfectly smooth.

Test contact pressure, clearances, and free working of moving parts. Replace weak springs.

Dirt impairs action of moving parts. Control boxes should be kept tightly covered and as nearly dustproof as possible. Moving parts should never be oiled, except in special cases where instructions specify lubrication.

Clean contacts by blowing out with clean dry air at 40 lb pressure. In extremely dirty cases, wipe or wash with carbon tetrachloride, never with gasoline or other inflammable solvents.

Is Voltage Correct?—Every piece of electrical equipment is designed to operate from a definite voltage and a specific type of current. An ac motor run on dc, or a three-phase motor run on single phase current will not operate efficiently.

Some motors are designed to work on two or more voltages. For

example, the voltage specified on a motor operating on either 120 or 240 v will be shown as 120/240 v. Be sure to make proper connections. A motor operated from 240 v with connections made for 120 v would burn out quickly.

Proper voltage to controls is a must. High voltage shortens coil and contact life. Low voltage can cause contact points to weld together because of weak pressure.

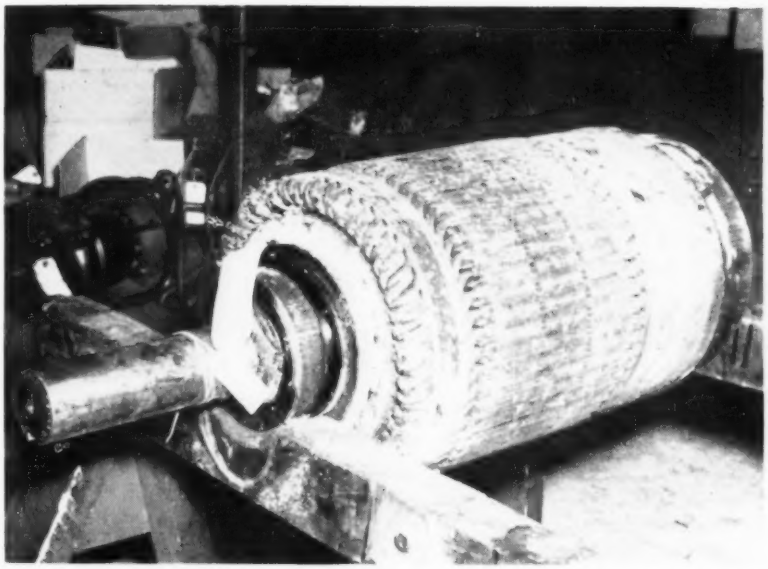
Care for Switchgear — Lighting switches, distribution panels, and control switching are subject to wear, dirt and oxidation. Worn or dirty switches should be replaced at once. They are both dangerous and inefficient.

A wrench, screwdriver, or other metal object falling into a distribution panel can cause short circuiting, costly damage, and injury to personnel. A cage of expanded metal or heavy hardware cloth serves as protection without hindering circulation of cooling air. Be sure the cage is solid enough so that it cannot be knocked into wires or terminals.

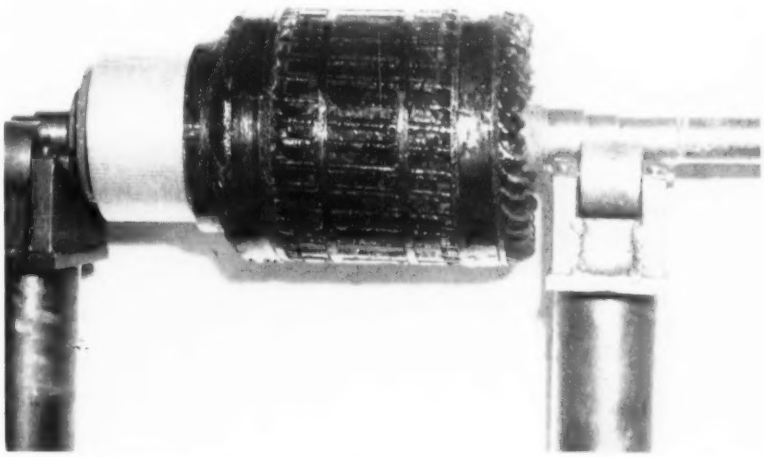
Identify Wiring—All wiring circuits should be marked to show type of service provided, such as 120 v for lighting and general use, and 240 v for power. It helps prevent unintentional connections to high voltage with resultant danger to men and equipment.

Extensions of permanent wiring should be made only from standard outlets, never by clipping leads onto a panel or switch. Extension cords should be made of at least No. 12 rubber-covered wire. Any cord that is worn, frayed, or grease soaked should be discarded and replaced.

Since three-phase current differs from the more common single-phase alternating current, it must be handled with care. Many an untrained workman has been fooled by the thought that the center wire of a three-wire circuit is dead, just as it is in a single-phase three-wire circuit. If there's any doubt, call in an electrical specialist.



EXAMPLE OF NEGLECT: Dirt in windings has caused overheating. Commutator segments have become glazed. (Westinghouse photo)



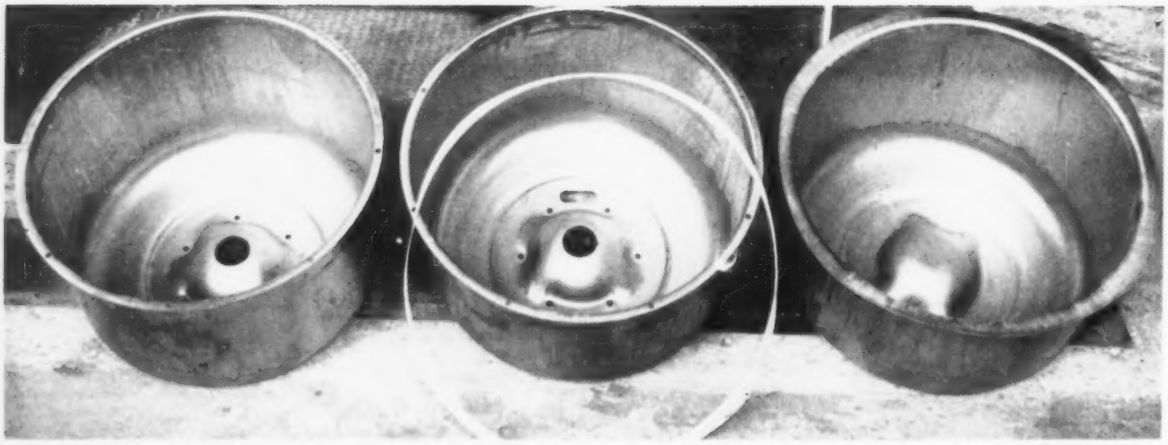
FRESH START: Whether new or reconditioned, a rotor gives long service under proper maintenance. (Westinghouse photo)

Indicator Lights Have Job—A man may be depending on one of these little indicators. If it isn't working, it may tell a false tale and cause injury or damage. It's easy to ignore a burned-out lamp, but it's just as easy to keep a stock of lamps on hand for quick replacement.

Any lighting system needs maintenance. A dirty reflector can cut the light output by 50 pct.

Fluorescent lamps dim somewhat with age and should be changed regularly. Lamp manufacturers recommend changing all the lamps at one time to save the labor of raising a ladder for each individual burnout.

On ventilating fans, dirty, gummy blades cause vibration and wear. Clean blades regularly with solvent.



TRIM AND PIERCE: Tub gets trimmed and pierced (center). Special setup punches 96 holes below flange (left).

How Press and Weld Steps Form Sheet Metal Units

By **Herbert Chase**—Consultant, Forest Hills, N. Y.

DEEP DRAWING: Washer tub starts as 36-in. diam blank coated with dry lubricant. Press deep draws shape 20-in. diam by 13 in. deep.

Production techniques on common appliances are often taken for granted.

It's the choice of the right equipment that gets high output.

▪ Sheet metal is a basic structural material for appliances made at the Hotpoint Co., Chicago.

Washer tubs start from 36-in. diam blanks of 0.050-in. deep-drawing steel. With a coating of dry lubricant and a "blister" impression at the center, the blanks are drawn to form a tub 20 in. diam and 13 in. deep. After drawing, successive steps form the bottom, trim the flange, and pierce holes.

Punch Holes Outward — A special hydraulic setup pierces 96 holes below the flange. The punches pierce outward to keep burrs on the outside of the tub, away from fabrics.

Arranged in four sets of 12 each, 48 punches move against four mat-

ing dies. Then the tub is indexed 90° to punch the remaining holes. The setup handles 133 tubs an hour.

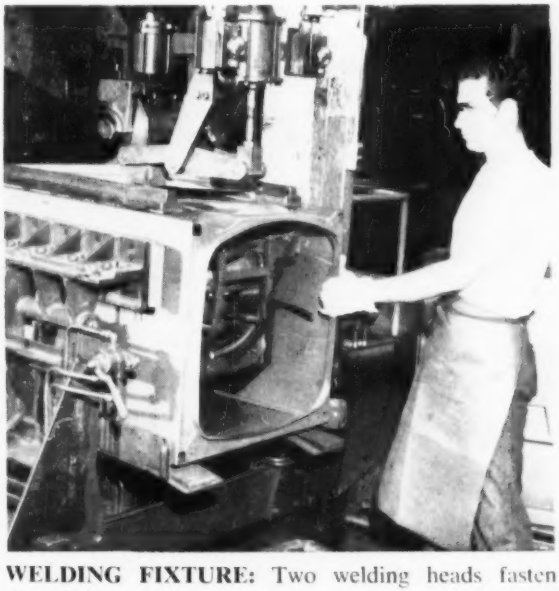
Sheet steel for washer cabinets goes through a metal parts washer before receiving dry lubricant. Subsequent steps take care of profiling, notching, trimming, and piercing.

In the final step before U-forming, a 96-in. press with two dies forms an offset flange with one die and completes forming at top, bottom, and sides with the other.

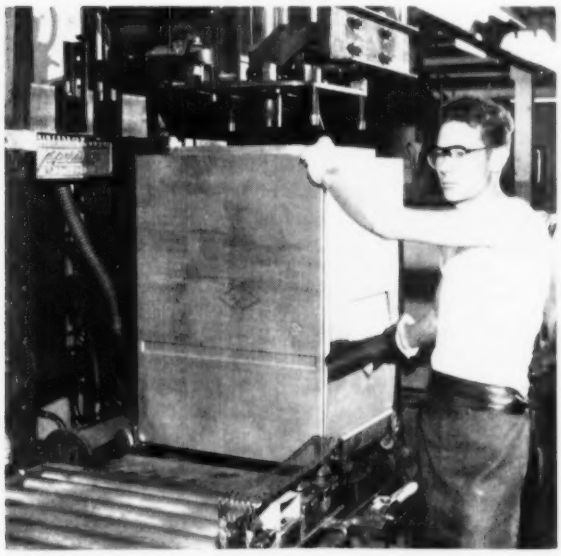
Welders For Job — A dual-head resistance seam welder joins the three-sided structure to a separate back panel. The unit clamps the faces to be welded against backing strips of an internal form. The two welding heads advance horizontally with wheels rolling along edges of the cabinet to weld the back panel to the side flanges.

Two resistance spot welders fasten a flanged bulkhead at a point about one-third cabinet height from the bottom. The bulkhead provides support for components and increases cabinet rigidity.

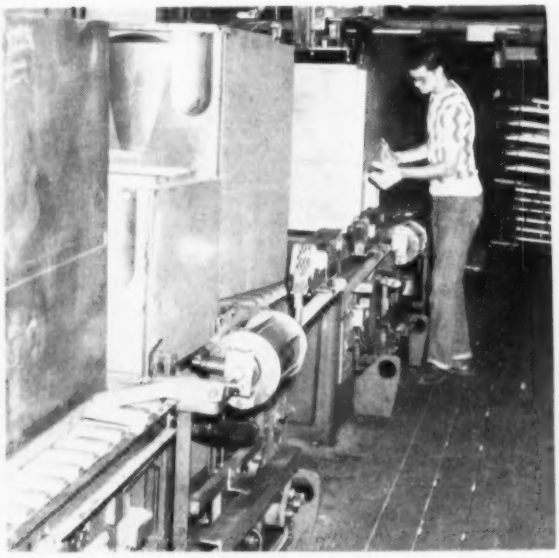
PREPARE SURFACE: Sheet steel for cabinets goes through metal washer to prepare for press steps.



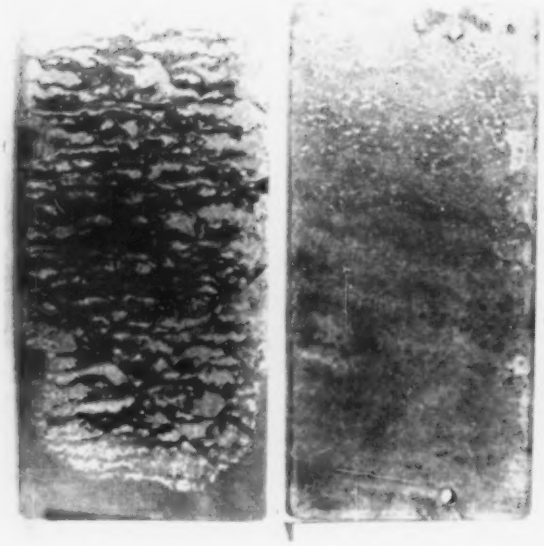
WELDING FIXTURE: Two welding heads fasten three-sided cabinet to back panel with seam welds.



SPOT WELDING: Spot welders get into narrow side recesses to fasten bulkhead flanges to washer housing.



INSIDE SUPPORT: Second unit spot welds bulkhead to front of cabinet. Bulkhead increases rigidity.



SALT TELLS STORY: After a 192-hour salt spray test, the 0.00025-in. thick electroplated cadmium deposit (left) is seriously affected. Vacuum-deposited 0.0004-in. thick coating (right) is still good.

TWO TOGETHER: There's more porosity in the 0.0015-in. thick layer of vacuum-deposited cadmium (bottom) than in the top layer (also 0.0015-in. thick) of electroplated metal. (450X).

Vacuum Deposition Avoids

By V. Dress—Materials & Process Engineering Dept., Lockheed Aircraft Corp., Burbank, Calif.

For years, aircraft engineers have been nagged by a hydrogen-embrittlement problem with cadmium plated steel parts.

There's one way to bypass the problem completely: Apply the cadmium in a vacuum chamber.

The vacuum technique offers other benefits, too, as this article explains.

■ There is no danger of hydrogen embrittlement when steel parts are cadmium "plated" by vacuum deposition. Moreover, cadmium coatings applied in this way can meet all military specifications for adherence, corrosion resistance and other key properties.

Using standard vacuum chambers and pumps, cadmium deposits between 0.0003 and 0.0005 in. thick can be maintained uniformly, and thicker coatings can be had if desired. "Throwing power" of the process is excellent, yielding almost completely uniform layers on high spots and recessed areas alike.

These facts were nailed down in a joint project conducted by Lockheed Aircraft Corp., and Anadite, Inc., a South Gate, Calif., metal finishing firm. Initial findings were checked out in detailed tests covering coating thicknesses, corrosion resistance, adhesion, and post-processing treatments.

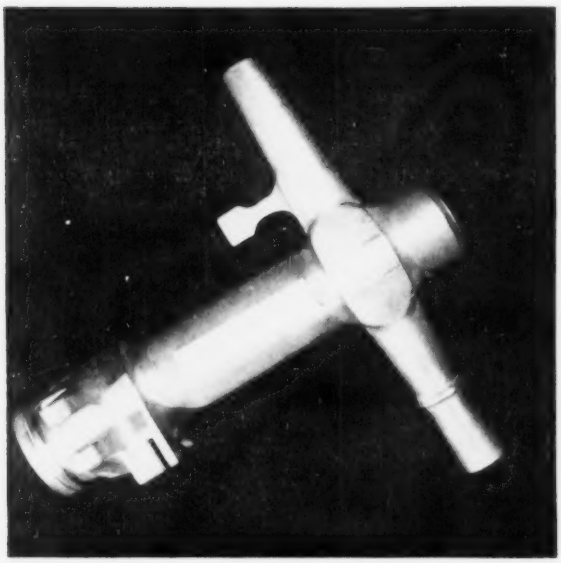
Test results were excellent. As a result, numerous Lockheed production parts now get the vacuum-cadmium treatment.

How It's Done—The basis for the original test program was to give all parts a light grit blasting (180 mesh or finer) before they were racked and set in the vacuum chamber. A few test pieces were preheated before racking, but for the most part, specimens and chamber alike were at room temperature when the roughing pumps were started.

Pumping time to reach 0.5 microns of pressure varied from 10 to 45 minutes depending on the type of equipment and atmospheric conditions.

Metallizing time to produce a 0.0005-in. thick cadmium coating ranged from 15 to 35 minutes. This depended on the operator's skill at regulating the rate of vaporization. If coatings were too thin after the first cycle, another was applied.

Parts Stay Cool—Top temperature reached by the parts due to heat radiation from the cadmium crucibles and metal condensation was about 175 F. With a few excep-



TYPICAL PART: Landing gear forging was first vacuum metallized with 0.0005-in. thick cadmium layer, left. After 192-hour salt spray test (right) it shows typical efflorescence but no rusting.

Embrittlement

tions, coated parts were not baked or otherwise treated before they were tested.

Adhesion tests were made according to Federal Specification QQ-P-416 for electroplated cadmium. Normalized or annealed sheet steel specimens 1 x 4 x 0.04 in. were bent through an angle of 180° on a diameter equal to specimen thickness. Examination was made at 4X magnification for evidence of separation from the base metal.

Coatings Adhere Well—When the base metal was reasonably clean, adhesion was always good and at least equivalent to electroplated specimens. This characteristic has since been verified by hundreds of production tests. Such failures as have occurred were due to contamination with dirt and oil before processing.

However, the slight grit-blast residue which remains even after specimens have been blown off with clean compressed air seems to have no effect on coating adherence.

When cadmium was vacuum deposited on polished surfaces of 302 stainless, 2024 aluminum alloy, and low alloy steel, adhesion was very poor. This indicates that a purely mechanical bond accounts for the adherence to grit-blasted surfaces.

Mask Chromed Areas — But where electroplated cadmium coatings can normally be blown or brushed off of chromium plated areas on production parts, chrome plated areas of parts to be vacuum metallized must be masked. The reason: It's hard to remove the cadmium layer from the chromium plate.

Other tests showed that as many as five successive coatings of cadmium did not affect adhesion. Moreover, no evidence of contact between coats could be seen under the microscope.

Uniform vacuum-deposited coating thicknesses required by specification QQ-P-416 are easily obtained by an experienced operator. There is little tendency for the cadmium to build up on part projections.

Proves Uniformity — For example, a vacuum coating was applied to the threads and shank of a bolt. This deposit was built up in four cycles without changing the position of the bolt in the metallizing rack. When checked, thickness was 0.0014 in. on the bolt shank, and an almost equivalent thickness of 0.0013 in. was deposited in the thread-root areas.

Keyways, slots and surfaces at right angles to each other receive uniform coatings in one application, and surprisingly good coats are thrown into holes.

Vacuum-deposited films are somewhat more porous than electroplated coatings. Specific gravity of one such plated film was found to be 8.22, compared to 8.12 for a vacuum deposited film.

Corrosion Test OK — Vacuum metallized coatings were also checked for corrosion resistance in line with Specification QQ-P-416. Post-plating chemical film treatments were omitted in most tests. In general, results show the vacuum

deposited coatings offer protection comparable to electroplated coatings of equal thickness, and they meet minimum specifications easily.

Vacuum metallized deposits ordinarily develop a white efflorescence in certain areas after salt spray tests. Areas that do not develop this white film appear as dark spots by contrast, but no rusting of the base metal occurs beneath either the dark or white sections.

In one case, a steel landing gear forging, vacuum coated with 0.0005-in. thick cadmium, was inspected after 192 hours exposure to salt spray. The coating was neither rusted nor blistered.

Beats Plated Part—Still another corrosion-resistance test compared an electroplated coating (processed to avoid hydrogen embrittlement) with a standard vacuum deposited coating. The plated specimens were processed in a specially controlled bath at a minimum current density of 60 asf for 2 minutes. This produced a plate 0.0002 in. to 0.00025 in. thick. The standard vacuum deposit was 0.0004 in. thick on the specimen tested. After simultaneous exposure to the 192 hour salt spray exposure test, the plated surface had failed generally, but the vacuum coated panel was still in satisfactory condition.

Many vacuum metallized aircraft parts have been subjected to salt spray tests with uniformly satisfactory results. The variety of configurations tested was thought to be representative of those found in aircraft components made from low alloy steel.

Accept Other Coatings — In another series of checks, vacuum metallized cadmium coatings received a number of post-processing chemical film treatments and organic coatings. They react to these in the same manner and with the same benefits as electroplated deposits.

To determine the effect of heating on the quality of coating obtained, a series of parts were preheated to 400°F before they were placed in the vacuum chamber. By the time the cadmium was deposited, temperature of the parts had dropped to about 200°F. No significant difference in the character of the coating could be seen, but adhesion appeared to be slightly less.

The appearance of heavy vacuum deposited cadmium coatings when properly applied is not as bright as the electroplated variety. They have a dull matte finish of gray white metallic luster, usually accompanied

RACKED UP: Parts to be vacuum metallized are racked on rotating frame which rolls into the chamber.

by a very light superficial dust. This dust, which can be rubbed off with the fingers, may account for the white efflorescence on salt-spray parts. However, it does not affect parts in subsequent processing.

Light buffing easily produces a bright finish of pleasing appearance, but such treatment does not enhance the protective value of the vacuum coating. Leaks in the vacuum chamber cause dark to black deposits, but salt spray tests show that such deposits are no less corrosion resistant than the gray-white coatings.

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TO MAKE CERTAIN: All vacuum metallized production parts, such as these steel springs, must pass a rigid visual inspection.

OPERATOR IS KEY: Vacuum cycle takes from 15 to 35 minutes, depending on the skill of the operator.

Clean Plant Water at Low Cost

Good water is getting harder to come by, especially in the quantities needed by much of today's industry.

Pollution abatement programs can't remove mud or silt, and most river water needs softening to reduce boiler scale.

Here's what a modern treatment system can do.

• Better quality water and more of it, from an installation occupying less than half the area. These are some of the advantages Jones & Laughlin Steel Corp. obtained at its South Side Works in Pittsburgh by replacing its old water-softening plant with modern clarifying equipment and an ion exchange system.

Replacement was made when soft-water consumption began edging up toward 2000 gpm with 100 pct make-up, somewhat beyond the old system's capacity. The water is used mainly for making steam. Soft water also goes in yard locomotives, and clarified water is used for hydraulic pressure accumulators.

Water softening is a basic plant process to prevent formation of hard water scale in boiler tubes, hot water lines and equipment. This line scale restricts flow through the pipe lines and requires periodic shut-downs of equipment for descaling. It also acts as an insulator that reduces heat exchange efficiency; a layer of scale 1 in. thick, which can accumulate very quickly in high-capacity boilers, has the same insulating value as about ¼ in. of asbestos.

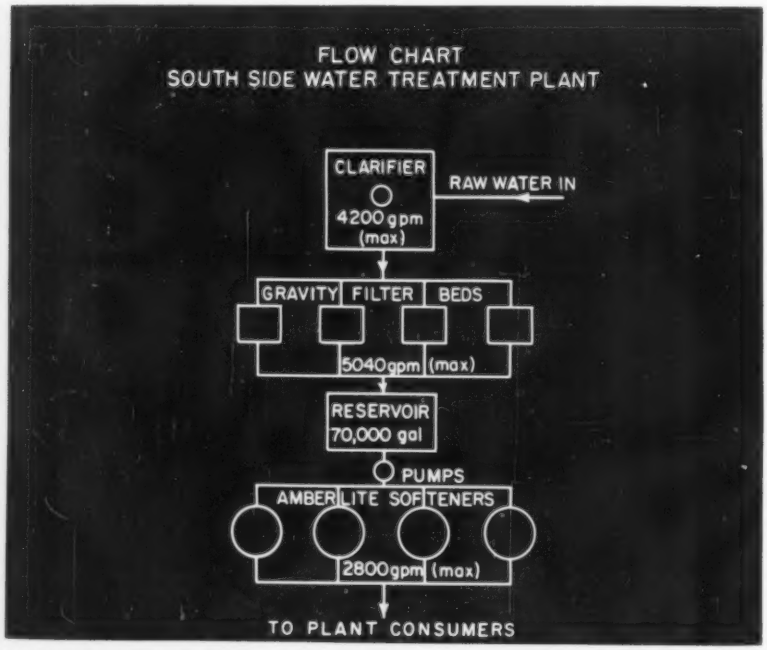
River Water Varies—Water for the South Side Works is drawn from the Monongahela River. Its quality varies widely, as shown in Table I. With the old conditioning system, water was softened by lime-soda ash precipitation in four 45-ft diam settling tanks of 420,000 gal capacity each. By this method, lime precipitates the calcium and magnesium bicarbonates as calcium carbonate and magnesium hydroxide.

Non-carbonate hardness (chloride and sulfate salts of calcium) is similarly removed by treatment with soda ash, which converts them to calcium carbonate and equivalent sodium salts. Precipitates, as well as most of the iron and suspended solids, settle out as a sludge at the base of the tank. Supernatant water is then drawn off, filtered to remove carried-over particles, and distributed for plant use.

For complete softening with lime-soda equipment, minimum retention time for reaction and settling is about 4 hours. Because of the slight solubility of the precipitated hardness, water can't be readily softened below 15 to 30 ppm hardness. Also, because the particles are small and resist settling, only about 360,000 gal of each tank at J&L could be drawn off for use. The system conditioned about 3,000,000 gal of water per day (2100 gpm) having an average residual hardness of 14 ppm.

Doubles Supply — To meet its rapidly growing need for more soft water, J&L installed a high-rate Accelator clarifier, gravity filters and a high capacity ion exchange system made by Infilco Inc., Tucson, Ariz. The new water conditioning system is designed to provide 4200 gpm of treated and filtered water, of which about 2800 gpm is reduced to zero hardness.

The new clarifying plant has twice the capacity of the old plant; the ion exchange system has a third more capacity and produces soft water of better quality. Yet, the space occupied is about 100 x 100 ft—less than half the area required for the old system.



HIGH OUTPUT: Flow sheet for water treatment system at J&L's South Side Works. High capacity clarifier and filters will permit installing extra softeners if needed.

The new system consists of four basic elements: an Accelator clarifier installed in a basin of about 200,000 gal capacity, for removal of suspended solids and partial softening of river water; four 14 x 30 ft concrete gravity filters containing a 3½ ft bed of graded coal for removing solids carried over from the clarifier; a 70,000 gal filtered water clearwell below the filters; and four 11 ft diam ion exchange water softeners. Each of the latter contains 125 cu ft of Amberlite IR-120, a high capacity nuclear-sulfonic acid cation exchange resin made by Rohm & Haas Co., Philadelphia. From the Amberlite softeners water is distributed directly to the various consuming facilities.

Solids Go First—The first treatment step occurs in the clarifier, where mud and suspended solids in the raw water are coagulated by adding activated silica and alum. At the same time, to take some of the load off the ion exchange softeners, some of the hardness can be removed by lime-soda ash treatment. When sludge concentration in the draft tube exceeds the control point, sludge is removed from the clarifier by a timed cycle.

Clarified water flows continuously by gravity to the four filter beds. Filtered water is collected in a 70,000-gal clearwell which constitutes basic supply for the entire plant. Reservoir level is maintained by automatic level controls.

From the reservoir, water is pumped at 100 psi by a set of three 1800-gpm pumps to the four Amberlite units for final softening. Each softener will soften about 230,000 gal of water having an initial average hardness of 255 ppm down to 1 ppm or less. Soft water is then distributed to plant consumers at various rates of flow through a 12-in. header. A summary of water quality at various stages of the conditioning process is given in Table II.

Much Less Scaling—One of the major advantages obtained from the high quality soft water has been a marked reduction in boiler tube scaling. The ion exchange softeners make it possible to operate boilers for five years and more before major descaling is necessary. The better quality water has also reduced consumption of boiler compound to about half, as well as the rate of blow-down for sludge removal.

Effluent from each softener is checked periodically and the resin bed is regenerated when the effluent reaches a hardness of about 4 ppm. The regeneration cycle is performed automatically by pneumatic controls operated from a central panel; 1300-lb of salt are used per regeneration, and the entire cycle takes about 1 hour and 40 minutes. Periodic washing of filter beds to remove trapped solids is also controlled from a central panel.

Table I

Typical Analyses of Monongahela River Water

	High, ppm	Average, ppm	Low, ppm
Calcium	67	30	12
Magnesium	24	10	4
Sodium	24	17	14
Sulphate	456	150	60
Total Hardness (as $CaCO_3$)	355	139	42
Total Dissolved Solids	674	263	101
Total Suspended Solids	270	25-100	10-15
pH	4.0	4.0	4.0

Table II

Analyses at Treatment Plant

	Clarifier Inlet*, ppm	Clarifier Outlet**, ppm	Softener Effluent, ppm
Calcium	44	44	1
Magnesium	10	10	—
Sodium	17	17	18
Sulphate	150	174	174
Total Hardness (as $CaCO_3$)	174	174	2
Total Dissolved Solids	276	310	314
Total Suspended Solids	25-100	7	1
pH	6.2	6.0	6.0

* Average river water prelimed for plant use to raise pH to 6.2

** Based on treatment with coagulating chemicals only

Self-Dumping Hoppers Speed Scrap Handling

The attention paid to handling of raw material and finished products is such that scrap handling is often neglected.

One plant finds the right unit can make scrap handling a part time job instead of the full time job with former methods.

▪ Self-dumping hoppers are reducing direct cost of handling of scrap to practically nothing. They replace wooden boxes at Athenia Steel Co., Div. of National-Standard Co., Clifton, N. J.

Where one man, permanently assigned, hauled wooden boxes to the loading dock by hand truck and emptied scrap by hand, fork-truck drivers now handle hoppers only when there are no other demands for their services.

Quick Handling—In the old system, scrap would often overflow containers because of the time it took to empty one box. With the self-dumping hoppers, made by Roura Iron Works, Inc., Detroit, a fork truck driver can pick up a load of scrap, weigh it, dump it, and return the empty hopper in 3 to 5 minutes. The existing number of trucks do the job without affecting other operations.

The self-dumping feature permits the driver to empty without getting off his truck. He trips a lever which lets the hopper tip forward. Tilting the forks backward returns the hopper to its upright position.

In addition to reducing costs and providing better handling, the hoppers have eliminated scrap container maintenance. It's in contrast to the task of repairing three or four of the wooden boxes every week. The 15 hoppers, most of 1-yd capacity, need virtually no maintenance.

FAST SERVICE: Fork truck operator can dump and return hopper to station in 3 to 5 minutes.

EASY DUMPING: Driver trips lever to tip hopper forward. Tilting forks backward returns hopper upright.

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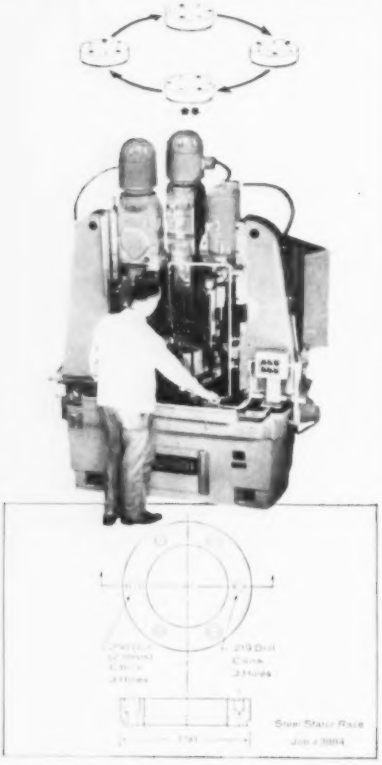


This Kingsbury indexing automatic performs these three operations on 290 steel stator races per hour (gross). Three vertical operating units have multi-spindle auxiliary heads. All tools have guide bushings to maintain accuracy. An air cylinder actuates the clamp.

Simple (like this) or complex, a Kingsbury is the best indexing automatic you can buy:

it will be fully tooled, ready to produce

it will meet your specifications for accuracy and production rate

it will pay for itself in a matter of months

We have designed, built and tooled thousands of automatic drilling and tapping machines. It is our only business. May we come see you? Kingsbury Machine Tool Corporation, Keene, New Hampshire.

KINGSBURY

INDEXING AUTOMATICS for high production drilling and tapping

FREE TECHNICAL LITERATURE

New Catalogues And Bulletins

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, p. 155.

Foundry Equipment

Molten metal handling equipment is featured in a catalog. It contains 72 pages of photos, dimension sheets and interesting data. (The Industrial Equipment Co.)

For free copy circle No. 1 on postcard, p. 155

Silicone Rubber

Properties of 50, 60 and 70-durometer silicone rubber sheets are analyzed in a data page. It tells about both regular and fabric-reinforced sheets, all available from stock. These sheets, it says, stand up well under severe temperatures (−85° to 500°F). They meet AMS 3302, 3304 and 3320 specifications. (Connecticut Hard Rubber Co.)

For free copy circle No. 2 on postcard, p. 155

Motor Control

Front access, high voltage starters for 2300 to 5000-v motors are detailed in a bulletin. It discusses design features that provide good accessibility, protection, performance and space economy. (Allis-Chalmers Mfg. Co.)

For free copy circle No. 3 on postcard, p. 155

Tractor Parts

Ever hear someone say, "Oh, these replacement parts I use are just as good as those recommended by the manufacturer"? Well, according to a new booklet, he's wrong. "Just as good parts," it states, "prove very expensive in operation of construction equipment." It stresses this theme: nobody knows a machine better than the firm that makes it! Copies come in English, French, Spanish or Portuguese. (Caterpillar Tractor Co.)

For free copy circle No. 4 on postcard, p. 155

Presses

C-type and straight side presses made by one company are described in an 8-page brochure as "the first major advance in press construction in 20 years." These presses have ball bearing ram raceways. (Precision Welder & Flexopress Corp.)

For free copy circle No. 5 on postcard, p. 155

Punch Press

Of 8-ton capacity, a new punch press is precision-built for fast, trouble-free production. A data sheet describes it. (Kenco Mfg. Co.)

For free copy circle No. 6 on postcard, p. 155

Milling Machines

Milling machines of several types are covered in a 4-page bulletin. It pictures and briefly describes a wide range of models. (U. S. Burke Machine Tool Div.)

For free copy circle No. 7 on postcard, p. 155

Alloys, Iron Castings

Alloy steel and iron castings turned out by a large ferrous and nonferrous casting job shop are discussed in a 16-page booklet. It

describes the company's operations, but more than this, it gives information that could be helpful to many metalworking firms. (Howard Foundry Co.)

For free copy circle No. 8 on postcard, p. 155

Deburring Tools

Tool products for deburring, chamfering and countersinking are detailed in a 4-page bulletin. It includes data on tools for working holes having openly exposed surfaces; outer edges of rods, tubes, bosses; holes drilled through into a blind cavity; holes line-drilled through two or more parallel walls; jobs where one entry does two faces. (Nobur Mfg. Co.)

For free copy circle No. 9 on postcard, p. 155

Chemical Milling

Chemical milling is the subject of a dozen-page booklet. It deals with facilities, applications, advantages and design factors of chemical milling. (U. S. Chemical Milling Corp.)

For free copy circle No. 10 on postcard, p. 155

Embossing Presses

Knuckle joint embossing presses shown in an 8-page brochure are 150 to 1000-ton capacity units. These units perform embossing, sizing, coining and other jobs. (Minster Machine Co.)

For free copy circle No. 11 on postcard, p. 155

Press Welders

Spot and projection press welders are covered in a 6-page folder. These machines join ferrous and nonferrous metals, large and small, via a wide range of welding operations. (Precision Welder & Flexopress Corp.)

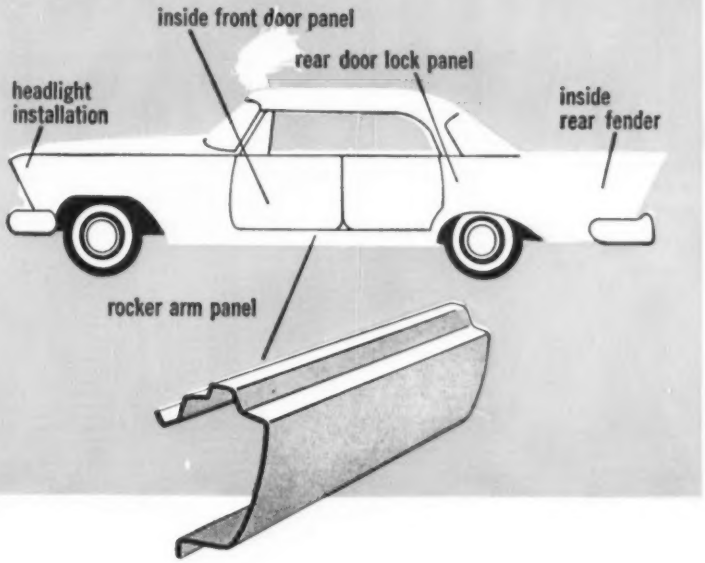
For free copy circle No. 12 on postcard, p. 155

Mill Products, Alloys

Aluminum mill products and alloys are presented in a comprehensive dozen-page brochure. It covers extrusions (from bars to hollow stock), press forgings, hand forgings and impact extrusions. Also

NOW! a weldable corrosion-resistant coating

Zincilate 400



IT'S NEW! Zincilate 400 was used first by the automotive industry on the late 1956 models.

IT'S PROVED! Zincilate 400 is now being used by more manufacturers, in more crucial areas, on the 1957 models.

IT'S EXCLUSIVE! Only Zincilate 400 can be applied before fabrication, then welded, minutes or months after application. You'll get fast, clean work — anytime — when you weld over a Zincilate 400 coating, because it retains its conductivity and contains no chemicals to contaminate electrodes. And, note this — Zincilate 400 provides galvanic protection, even at the point of burn-off, that keeps corrosion shackled.

You can use Zincilate 400 on your product, applying it as the automotive people do, by spray, brush or dip, before fabrication and welding. Your product, if it's made of metal, will be protected — always — by Zincilate 400.

Cost? You'll find many coatings with a lower first cost. But overall costs, where it really counts, are lowest when you're using Zincilate 400. If you'll outline your problem, we'll be happy to tell you just what you can expect of Zincilate 400—and there's no obligation.

Zincilate

CORROSION-RESISTANT, ABRASION-RESISTANT, WELDABLE, AIR-DRIED and BAKED PROTECTIVE COATINGS

INDUSTRIAL METAL PROTECTIVES, INC., 402 HOMESTEAD AVE., DAYTON 8, OHIO

WORLD'S
LARGEST
STOCK
52100
STEEL

Peterson
STEELS, INC.
Union, New Jersey • Detroit, Michigan • Melrose Park, Illinois

FREE LITERATURE

featured are services for extruding and forging steel and titanium. (Harvey Aluminum Sales, Inc.)
For free copy circle No. 13 on postcard, p. 155

Part De-freezer

For loosening stuck metal parts, etc., a well-known metal de-freezer now comes in pressure cans. This shoots the liquid chemical 3 ft at the press of a tiny valve. Its obvious advantages include: labor time-savings; ease of application; it's handy, lets workers free stuck parts even in difficult-to-reach spots. And the chemical is good for a multitude of other uses too (i.e., lubricating air-driven tools, storing dies, cleaning tools). (Kano Laboratories).
For free copy circle No. 14 on postcard, p. 155

Transformers

Open dry-type transformers are covered in an 8-page catalog. It describes transformers rated 300 kva and above, 15 kv and below. (General Electric Co.)
For free copy circle No. 15 on postcard, p. 155

Mobile Shops

Mobile machine shops are covered in a new leaflet. It describes truck-mounted units designed to meet all needs of users operating over extensive areas. (Davey Compressor Co.)
For free copy circle No. 16 on postcard, p. 155

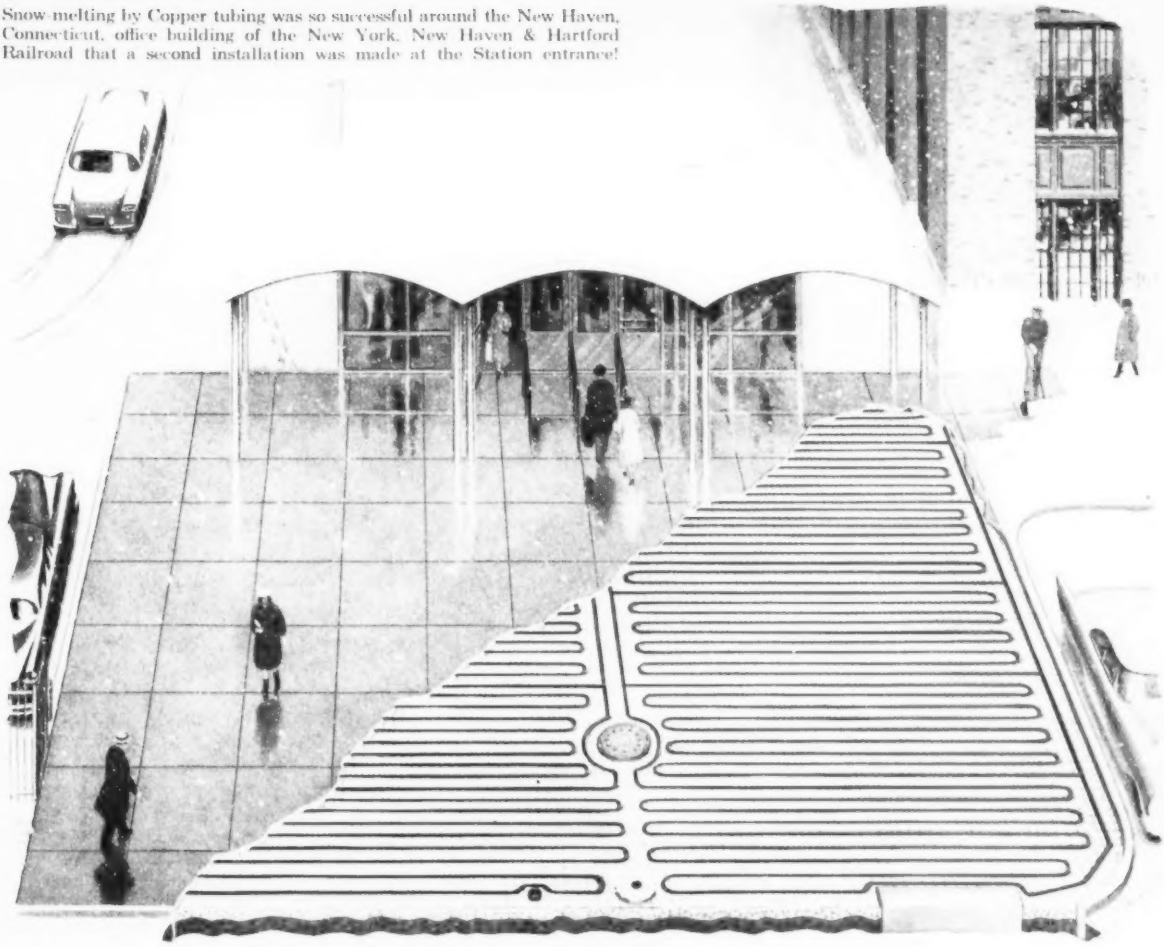
Profilometer

Profilometer units are described in a 14-page catalog. These units measure over 85 pct of all type surfaces. (Micrometrical Mfg. Co.)
For free copy circle No. 17 on postcard, p. 155

Motor Controls

Synchronous motor controls are described in an 8-page bulletin. It discusses synchronous motor operation and explains how a particular setup gives step-by-step control of such motors. (General Electric Co.)
For free copy circle No. 18 on postcard, p. 155

Snow-melting by Copper tubing was so successful around the New Haven, Connecticut, office building of the New York, New Haven & Hartford Railroad that a second installation was made at the Station entrance!



Add COPPER
...and stop shoveling snow!

In New Haven at the railroad station, snow is removed by melting. Hot water, circulating through Copper tubes embedded in the pedestrian pavement, keeps the whole area clear!

Installing a snow-melting system . . . in front of a store or bank or office building or along residential sidewalks and driveways . . . *is easiest with Copper.* For Copper tube comes in 60 and 100 foot lengths, minimizing the number of joints needed. These joints are quickly made too . . . by soldering or brazing. Also, the flexibility of Copper tube makes most of the bending something a mechanic can do with his two hands and a knee!

And the life of the completed, continuous heating coil? Just about *unlimited.* For Copper means virtual absence of corrosion and consequently a smooth, free flow of the heating medium at all times. No clogging with rust or other matter.

For other applications, Copper offers other superior properties, too. It's the best conductor of electricity commercially available. It is easy to machine, draw, form, stamp, polish, plate. And you can count on an ample supply of Copper to meet all your future needs.

COPPER · BRASS · BRONZE
in over 40 Standard Alloys!

For other examples of Copper tube's lower cost of installation, write the Copper & Brass Research Association, 420 Lexington Avenue, New York 17, N.Y.

The PROOF of DSC STEEL is in its PERFORMANCE ON YOUR JOB

DSC Deep Rolled RBF Strip

(the sure-working steel with eye appeal)

helps K-VENIENCE* clothing carriers satisfy airline appearance and serviceability requirements

CAPITAL'S WORLD-RENOWNED VISCOUNT

PHOTOS: COURTESY KNAPE AND VOGT MFG. CO. AND CAPITAL AIRLINES

These carriers, like other K-Venience clothes closet fixtures, promote housekeeping efficiency in the home, in stores and offices . . . and in airplanes.

What makes these products BIG BUSINESS? For one thing, they are good-looking. They do a needed job neatly, efficiently, durably. Attractively priced, they appeal to the value-wise lady-of-the-house and to professional buyers.

How does DSC STRIP help create these values? The answer is in its deep-rolled brightness, even gauge and uniform temper. These job-fitted qualities combined with capable workmanship and expertly designed tools and dies make for rapid, steady production. Results: fabricating, finishing and assembly costs are closely controlled, purchasing profits nailed down. That's how DSC STRIP has been consistently performing for the Knape and Vogt people for 17 years.

THE FINEST YOU CAN BUY

KV FIXTURES

Clothing carriers are among K-VENIENCE clothes closet accessories. Other KV products include store fixtures and builders hardware.

Ask a DSC Customer "Rep" about testing DSC STRIP yourself . . . Soon?

DETROIT DSC STEEL

Customer Satisfaction Is Our Business

DETROIT STEEL CORPORATION

GENERAL SALES OFFICE, DETROIT 9, MICHIGAN

DSC CUSTOMER "REPS" IN PRINCIPAL CITIES

DSC MILLS AND PRODUCTS

PORTSMOUTH DIVISION, PORTSMOUTH, O.

Coke • Coal Chemicals • Pig Iron
Basic OH Steel Ingots • Blooms • Slabs • Billets • Rods
Hot Rolled and Cold Rolled Sheets • Low and Medium Carbon
Manufacturers' Wire • High Carbon Specialty Wire • Aluminum Cable Strand
Reinforcement • Rope Wire • Tire Bead Wire • Welded Wire Fabric

MILL DIVISION: DETROIT, MICH., HAMDEN, CONN.

Cold Rolled Carbon Steel Strip
Flat Cold Rolled Carbon Spring Steel

*Reg. T.M. Knape and Vogt Mfg. Co., Grand Rapids, Michigan

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FREE LITERATURE

Continued

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

Power Shafts

A new bulletin describes one maker's standard flexible shafts for power transmission. Here are seven sizes ranging from ¼ through 1¼ in. diam, in two types (bronze bearing and ball bearing) and in four standard lengths each, making a total of 56 units from which to choose, all from stock. (B. W. Elliott Mfg. Co., Inc.)

For free copy circle No. 20 on postcard

Vibration Pads

Anti-vibration mounting pads are described in a bulletin. These pads eliminate noise and vibration transmission. The resilient cross-ribbed pads fit under a leg or bearing plate of any machine. They're made of special du Pont oil-resistant neoprene. (Vibration Mountings, Inc.)

For free copy circle No. 21 on postcard

Ultra-thin Titanium

Precision-rolled titanium strip is presented in a data sheet. It covers physical and chemical characteristics of titanium rolled to thicknesses as low as 0.0005 in. to tolerances as close as ±0.0001 in. (American Silver Co.)

For free copy circle No. 22 on postcard

Fan Testing

"Prototype Fan Testing and Computations for Testing Fan Equipment" has just been revised by a trade group. Revisions include reference sources for laws of fan performance. The 4-page bulletin tells how prototype fans are tested to obtain accurate performance characteristics for a complete series of fans of the same or larger sizes. (Air Moving & Conditioning Assn.)

For free copy circle No. 23 on postcard

Wash Fountain

Modern sanitary wash fixtures are described in a bulletin. It details newly designed duo wash fountains. (Bradley Washfountain Co.)

For free copy circle No. 24 on postcard

Ceramic Magnets

Applications of ceramic permanent magnets to small dc motors are discussed in a publication. The magnets require different design approaches than those developed for Alnico magnets. Comparison with wound fields, advantages and limitations of the new design, and recommended magnet design procedure are all dealt with. (Indiana Steel Products Co.)

For free copy circle No. 25 on postcard

Automatic Welders

Exclusively devoted to automatic welders, a bulletin discusses distinct problems in joining automotive parts. It describes solutions to these using one maker's custom designed automatic welders. (Dix Engineering Co., Inc.)

For free copy circle No. 26 on postcard

Corrosion Preventives

Military - specification corrosion preventives for industrial and military use are presented in a chart. It offers data on 20 corrosion preventatives. These include solvent cutbacks, petrolatum barriers, general purpose preservatives and engine preservation lubricants. (Pennsylvania Refining Co.)

For free copy circle No. 27 on postcard

Carbide Blades

More cuts per grind, and higher cutting speeds on very abrasive nonferrous metals are promised for new solid carbide blades in a company's literature. These blades are used

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. 12/19/57

Circle numbers for Free Technical Literature or Information on New Equipment:

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31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
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FIRST CLASS PERMIT No. 36 (Sec. 349 P.L.&R.) New York, N. Y.

BUSINESS REPLY CARD

No postage necessary if mailed in the United States

POSTAGE WILL BE PAID BY

THE IRON AGE
Post Office Box 77
Village Station
NEW YORK 14, N. Y.

BUSINESS REPLY CARD

No postage necessary if mailed in the United States

POSTAGE WILL BE PAID BY

THE IRON AGE

Post Office Box 77

Village Station

NEW YORK 14, N. Y.

FIRST CLASS PERMIT No. 36 (Sec. 34.9 P.L.&R.) New York, N. Y.

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. 12/19/57

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Company .....

Co. Address .....

City ..... Zone .....

State .....

FREE LITERATURE

with the firm's adjustable spotfacers and counterbores. (Robert H. Clark Co.)

For free copy circle No. 28 on postcard

Cold Heading

A brochure details modern job shop facilities for producing cold-headed metal specialties and threaded fasteners. The company makes small parts of alloy, stainless and carbon steel, aluminum, brass and bronze. (Quality Fasteners, Inc.)

For free copy circle No. 29 on postcard

Dressing Diamonds

Techniques for optically presetting diamonds for use on contour wheel dressers are illustrated in a bulletin. It shows how either preadjusted single or double diamond holders can eliminate grinder downtime during diamond replacement. (Hoglund Engineering & Mfg. Co.)

For free copy circle No. 30 on postcard

X-ray instrumentation

A 12-page booklet gives engineering data on X-ray instruments for element analysis and structure determination. (Instruments Div., Philips Electronics, Inc.)

For free copy circle No. 31 on postcard

Forging Tool Steels

Tool steels for forging operations are described in a booklet. It contains 16 pages of technical data—all based on recent research. Properties, heat treatment and application of tool steels are covered. (Crucible Steel Co. of America)

For free copy circle No. 32 on postcard

Centrifugal Fans

Centrifugal fans are covered in a catalog. It describes efficiency and quietness of airfoil blading for all-purpose applications in a complete standard line of centrifugal fans covering every requirement up to 700,000 cfm and up to 16¾-in. total pressure. (Sturtevant Div., Westinghouse Electric Corp.)

For free copy circle No. 33 on postcard

Towing Tractors

Industrial towing tractors are outlined in a new piece of literature. (Buda Div., Allis-Chalmers Mfg. Co.)

For free copy circle No. 34 on postcard

Beryllium Oxide

Beryllium oxide is analyzed in an 8-page folder. This is a refractory oxide of the light metallic element beryllium. It has very high thermal conductivity, the brochure states—the highest of any presently known refractory or ceramic material—coupled with high electrical resistivity and dielectric strength. (The Beryllium Corp.)

For free copy circle No. 35 on postcard

Tubing Protection

For users and handlers of welded carbon tubing, a bulletin gives data on protective coatings. It details various protective coats and indicates conditions under which such materials supply the necessary protection. (Tubular Products Div., Babcock & Wilcox Co.)

For free copy circle No. 36 on postcard

Compressor

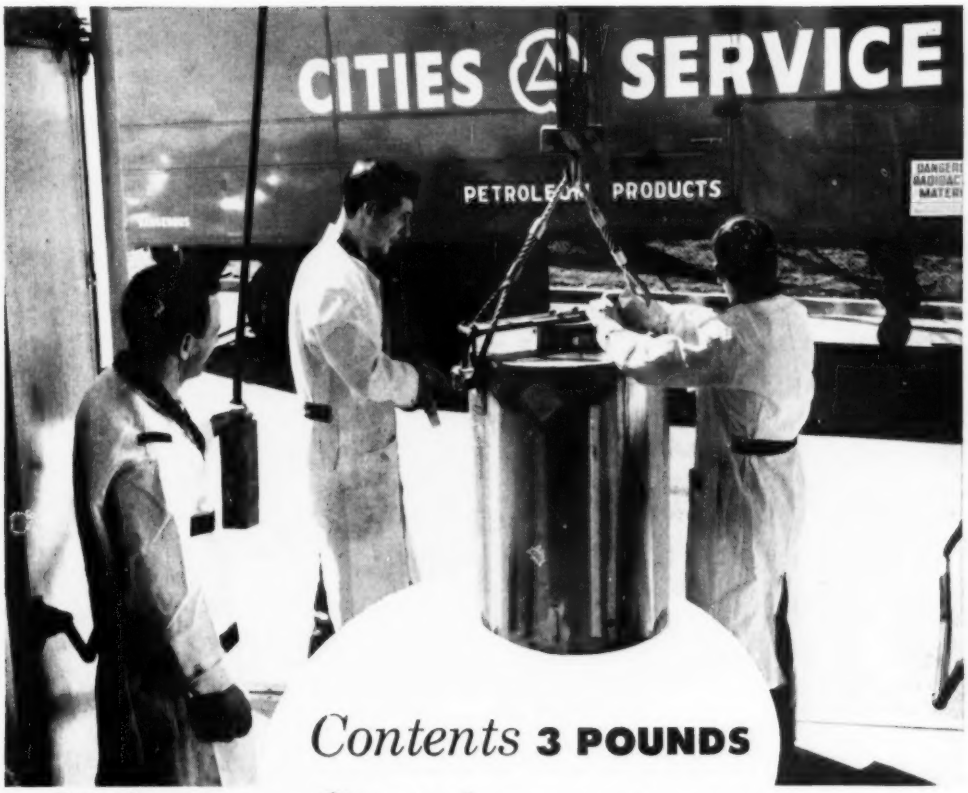
V-angle compressors are described in a bulletin. It covers parallel turbocharging of engine-driven compressors for service from 330 to 825 bhp for application on field gathering repressuring and refinery service. (The Cooper-Bessemer Corp.)

For free copy circle No. 37 on postcard

Safety Equipment

Face and eye safety equipment is listed in a 28-page brochure. It covers goggles, glasses, lenses, welding helmets, hand, face shields, respirators, etc. (Sellstrom Mfg. Co.)

For free copy circle No. 38 on postcard

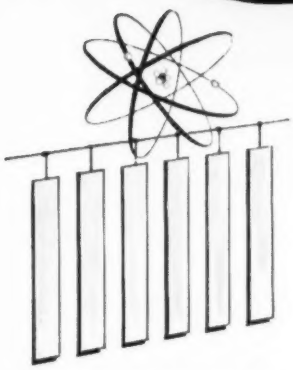


Photograph courtesy
Cities Service Company

Contents **3 POUNDS**

Container **3 TONS**

HOT CARGO. . . *and* **LEAD** *was the most practicable material for handling it!*



The shipment consisted of six strips of cobalt, each 16 x 2 x ⅛ inches.

Consider this safety problem involved. With a potency of two and a half times the world's supply of radium, three pounds of irradiated cobalt had to be delivered recently from Brookhaven National Laboratory on Long Island to the radiation section of the newly constructed Cities Service Research and Development Company Laboratory at Cranbury, New Jersey. It was the most potent shipment of its kind ever to leave Brookhaven.

For its journey, the metal was encased in a three ton protective lead shield!

Another example of the protective value of LEAD in the field of nuclear activity! While other materials including water, dense concrete, and other heavy metals such as gold also can shield workers, they are much less practicable. They require great masses. A relatively small mass of lead provides adequate shielding. Hence, its use as container material for this and similar shipments.

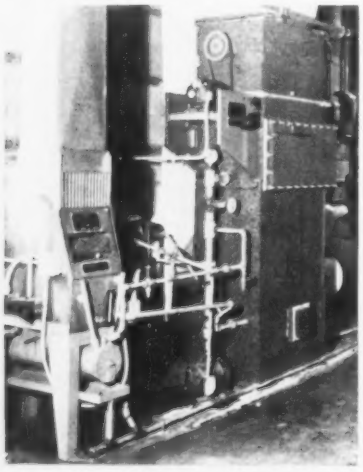
In addition to the well-recognized and time-tested uses of lead in the rapidly growing nuclear field, LEAD continues to broaden its usefulness in other fields: ceramics, building materials, decorative finishes, special steels, protective paints, processing equipment, lubricants.

Old uses of lead are expanding. New uses are coming into the picture.

ST. JOSEPH LEAD COMPANY
The Largest Producer of Lead in the United States
250 PARK AVENUE, NEW YORK 17, NEW YORK

EXACT CONTROL

of Moisture Content
To Improve your Product
or Protect Your Materials
or for Processes or Tests



● This Niagara Air Conditioning Method dries air directly and measurably, using a moisture-absorbing liquid spray. It makes humidity control a separate function from lowering or raising temperatures and gives you precise control with thermostats alone; no moisture-sensitive devices are needed. You have simpler, more trustworthy, less expensive control instrumentation. Niagara precise-control installations have the best record for reliability.

Niagara Air Conditioning provides you with any temperature and relative humidity you need. Using "Hygrol" absorbent, it is not expensive to operate, saving the refrigeration commonly used to condense moisture and making re-heat unnecessary in most cases. It gives large capacity with compact, easily-maintained equipment. Ask for descriptive Bulletins No. 112 and No. 121.

NIAGARA BLOWER COMPANY
Dept. IA-12, 405 Lexington Ave.
New York 17, N. Y.
District Engineers
in Principal Cities of U. S. & Canada

Grinds Spiral Point On Twist Drills

A new drill point boasts many advantages. It produces better holes, makes tools last longer and does much more, claims its developer.

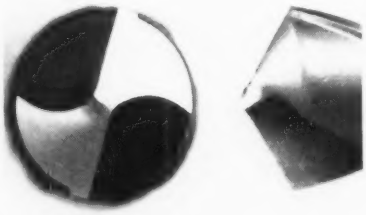
Sharpening currently stocked drills with this new edge isn't easy, though, unless you use a special grinder. But using such a unit, you can convert present drills quickly, easily.

▪ Extensive research and development tests have convinced the creators of a new spiral pointed twist drill that it is the most efficient drilling tool yet devised. The drill has a true, self centering point and an S-shaped cutting edge in place of the familiar chisel point (The IRON AGE, Oct. 17).

Claimed advantages for the new design range from finer possible accuracy to direct cost-cutting (i.e., subsequent reaming is unnecessary in many cases). Cincinnati Milling Machine Co. researchers who pioneered the design say the spiral-pointed drills: (1) last longer; (2) produce rounder, straighter, on-size holes; (3) need no center punching; (4) work with less thrust force; (5) reduce workpiece distortion; (6) maintain hole-positioning accuracy; (7) save reaming in many cases; and (8) yield burr-free holes in sheet metal.

"Practically Impossible"—Don't run to your nearest job-shop grinding machine and attempt to change all your drills from the conventional point to the S-shaped design, though. It's extremely difficult—if not practically impossible—to hand-grind your chisel-point tools into spiral-pointed ones.

However, a new drill sharpening unit produced by Cincinnati Lathe & Tool Co. economically grinds standard twist drills into the new spiral point in a matter of seconds. Though the machine applies a fairly complex shape, it can be operated easily and rapidly to produce a precision drill point.



This is the unique new spiral-point twist drill. . . .

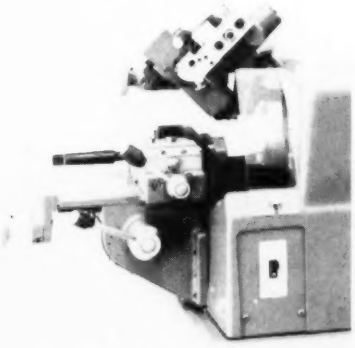
How It Works—The drill is held stationary and the generating system gyrates around the drill axis. This produces the desired shape on the end of the drill. An adjustable truing device provides for dressing

Want More Data?

You may secure additional information on any item briefed in this section by using the reply card on page 155. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

the small tubular grinding wheel; thus, the point angle of the drill may be varied from about 90 to 180°.

Called the Spiropoint, the grinder comes in two sizes. One model accommodates drills from ⅛ to



. . . and this is the grinder that turns out the new tool edge.

½-in. diam; another handles drills from ⅛ to ¾ in. An attachment is available which enables both models to grind from No. 60 (0.040 in.) to ⅛-in. drills.

Works Easily—In operation, a setup man places the drill between vise jaws on the advancing slide of the machine. It locates against a retractable stop. Then it's clamped in place. It advances so as to engage a continuously gyrating wheel mounted in a rotatable carrier.

The correct combination of radial and axial motions for the size of drill being sharpened is set automatically in the machine by a dial-indicated adjustment located on the top of the unit. An adjacent smaller dial provides adjustment for values of relief above or below the standard amount in order to meet special requirements.

Studies Impurities

Scientists at General Electric Research Laboratory, Schenectady, N. Y., are currently studying the motion of impurities in metal. In one project, Dr. Robert Powers of the Metallurgy and Ceramics Research Dept. is trying to learn more about the known fact that certain impurity atoms, moving within a metal crystal

a bright new wire with a brighter tighter finish

SO BRIGHT—Use *Brytite* wherever a shinier, brighter zinc coating is desired for long lasting, more sparkling product appearance. Eliminate polishing and special finishing operations

SO TIGHT—Brytite has remarkable forming qualities. The zinc coating is so tight it will withstand severe deformation of the base metal without flaking, powdering or peeling.

SO CLEAN AND SMOOTH—Satin smooth in looks and feel, BRYTITE immediately raises the quality appeal of your product. You get smoother production, too—the result of precise uniformity and quality controls.

ROUND AND SPECIAL SHAPES—*Brytite* is available in many sizes in round wire, and may on inquiry, be furnished in standard and special shapes—flat, half-round, oval, half-oval, square, rectangular, and many others.

Brytite

A PATENTED GALVANIZING PROCESS ®

TEMPERS AND ANALYSES—Specify BRYTITE in various tempers and analyses in the low carbon and medium low carbon steels.

FINISHES—Satin Finish, Unwiped (where a heavy weight of zinc coating is required) and Redrawn, in certain sizes.

no polishing...no buffing...no finishing...

withstands difficult forming operations

CONTINENTAL STEEL

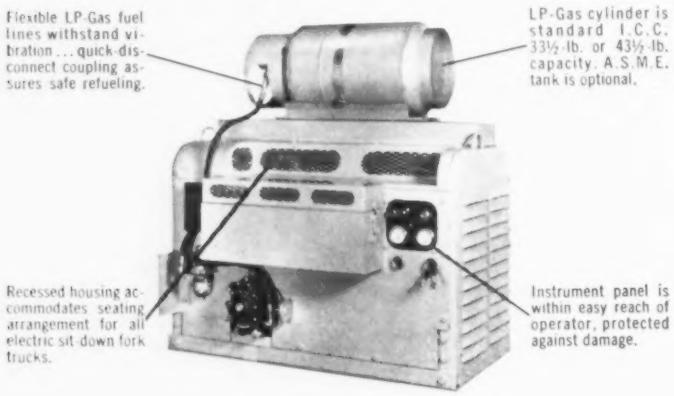
CORPORATION · KOKOMO, INDIANA

PRODUCERS OF Manufacturer's Wire in many sizes, tempers and finishes, including Galvanized, KOKOTE, BRYTITE, Flame-Sealed, Coppered, Tinned, Annealed, Liquor Finished, Bright, and special shaped wire. Also Welded Wire Reinforcing Fabric, Nails, Continental Chain Link Fence and other products.

Ready-Power LPG-Electric Power Unit for Sit-Down Trucks

MODEL HA-3 FOR 4000-6000 LB. FORK TRUCKS

Now, get the advantages of full-time LPG-electric power for *any* electric, sit-down fork truck, regardless of make or model. Compact Ready-Power model HA-3 accommodates all seating arrangements . . . assures remarkably low-cost operation . . . minimizes objectionable fume problems. Compact LP-Gas cylinder is mounted on top of engine-generator housing for quick, easy interchangeability. Hinged cover and side plate give easy access to engine accessories; removable end plate permits service of generator. LP-Gas components are listed by Underwriters' Laboratories and comply with Factory Mutual recommendations. Write today for full information.


Flexible LP-Gas fuel lines withstand vibration . . . quick-disconnect coupling assures safe refueling.
LP-Gas cylinder is standard I.C.C. 33½-lb. or 43½-lb. capacity. A.S.M.E. tank is optional.
Recessed housing accommodates seating arrangement for all electric sit-down fork trucks.
Instrument panel is within easy reach of operator, protected against damage.

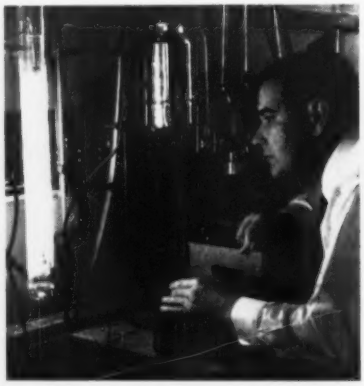
READY-POWER

The READY-POWER Co., 3822 GRAND RIVER AVE., DETROIT 8, MICH.

Manufacturers of Gas and Diesel Engine-Driven Generators and Air Conditioning Units; Gas and Diesel-Electric Power Units for Industrial Trucks

lattice, affect the mechanical damping properties of the metal.

As a result, he is able to study the diffusion of carbon in vanadium by measuring the damping of a vibrating vanadium wire at various temperatures. The wire is heated in



Impurities escape as researcher vacuum-heats vanadium wire.

a vacuum to drive off impurities. Then, selected impurities are introduced.

Following this, he places the wire into a vertical furnace. Two jets of air twist the wire in two. Twisting and untwisting reflects light from a mirror to a distant scale, measuring the degree of damping.

Woven Wire Backstop Halts Flying Chips

How do you contain flying chips of titanium in a small area around a drop forge? An eastern manufacturer, faced with this problem, found an answer in a woven wire curtain manufactured by the Cambridge Wire Cloth Co.

Earlier attempts employed solid steel barriers. These failed; the hard chips either ricochetted dangerously or ripped right through the rigid shield. Woven wire, on the other hand, seems to be just flexible enough to catch the flying bits of metal, equalize the impact and drop them harmlessly to the floor.

How It's Made—The curtain is suspended from a bar mounted

across the tops of two A-frames. The bottom of the curtain is left unattached to allow high flexibility of the woven wire fabric.

The curtain offers the additional advantage of being easily removed from its mount and rolled for storage, when the forge is not in use. In fabricating the specialized backstop curtain, the wire cloth company employed the same 14-gage carbon steel wire mesh used in its primary products, woven wire conveyor belts.

How To Get The Most From Tow Handlers

Tow-line or tow-conveyor systems are gaining in popularity as an efficient way to move materials over regular routes. Today most new installations are of the floor type, because the chain-way can be installed when the new floor is cast. But when the system is being installed in existing construction, the chain is generally overhead.

The easy attachment or detachment of trailers to the chain adds flexibility to the system at: freight handling stations, warehouses, assorting bays, and even on straight production lines. And the basic engineering concept of tow-line or tow-conveyor handling combines the advantages of a conveyor system with those of the tractor-trailer system.

Much of the engineering wisdom in specifying for a tow-line system lies in the selection of the trailer equipment. Specification engineers at Mercury Mfg. Co. Div., Pettibone Mulliken Corp., Chicago, recommend careful consideration of the following six factors:

Strong Masts A Must—Masts or front load guards of trailers for towing by overhead methods should be rigid enough to resist forces in all directions. Such forces are particularly strong when trailers are towed up grades or around corners. The mast is usually an upright angle-iron frame at the lead end of the trailer and is fitted with a bridle-type tow chain (anchored at both sides).

Springs in the chain assembly are desirable as they cushion the load when the chain is hooked to the moving tow-conveyor.

Use Rugged Trailers — Trailers should be built ruggedly enough to withstand collisions. Operators may become careless and not pull disengaged trailers free of the path of travel of the others. Or they may not time trailer couplings correctly, thereby causing collisions. They may also push uncoupled trailers into walls or other trailers. Such possible accidents influence many engineers to specify steel frames of T-section.

The T-section is stronger structurally than the angles used on some trailers. Also desirable are reinforc-

A NEW LINE OF DAKE *air hydraulic* PRESSES

FOUR NEW MODELS

25 TONS provides easy operation, low cost, and speed for general pressing and production work.

50 TONS for assembling, straightening, bending in minimum time.

75 TONS for handling heavy-duty press jobs quickly and easily. Ideal for machine shops, tool and die shops.

150 TONS for extra-heavy press work in heavy industry. This press is recommended for construction work, fabrication, and repair work requiring extra-heavy pressures.

CHECK THESE IMPORTANT DAKE FEATURES

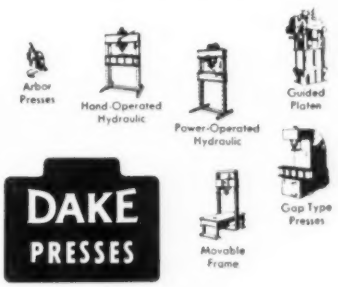
√ **Rapid Ram Approach**—automatically changes to power stroke when it contacts the work.

√ **Movable Workhead**—self-contained, easy to center over work. Workhead can be purchased separately.

√ **Modern Design**—all of the operating controls are at convenient working height.

√ **Extra Long Stroke**—handles long pressing jobs more easily.

DAKE CORPORATION, 602 Seventh Street, Grand Haven, Michigan



DAKE PRESSES

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602 Seventh St., Grand Haven, Mich.

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ing angle-iron sills running lengthwise of the frame, and an all-welded type of construction.

Round Corners Better—The T-section frame should be formed with rounded corners. Such corners are generally stronger than square corners. And they allow closer spacing of trailers around turns of short radii. They also avoid damage caused by sharp square corners colliding with equipment, products and personnel.

Check Wheel Size—Be sure to specify wheels large enough to roll easily over small obstructions and litter. Their low rolling resistance helps the whole line to operate smoothly and without surges.

Plate type 10-in. diam ball-bearing casters have proved satisfactory for front wheels. Rear wheels, usually mounted on a through-axis, are larger (12-in. diam) than front wheels as they often bear most of the load.

The trailer's rolling resistance should be no higher than the industry's standard of 40 lb per ton.

Get Wheel Location Right—Proper location of the fixed rear wheels and the caster front wheels is important. Long experience in tow-trailer design shows that rear wheels should be about one-third of the deck length from the rear of the trailer.

Front wheels should be about one-sixth of the deck length from the front of the trailer. These should give the best combination of good trailing and no whipping consistent with longitudinal stability. On tow-lines (with their many turns) good trailability is vital.

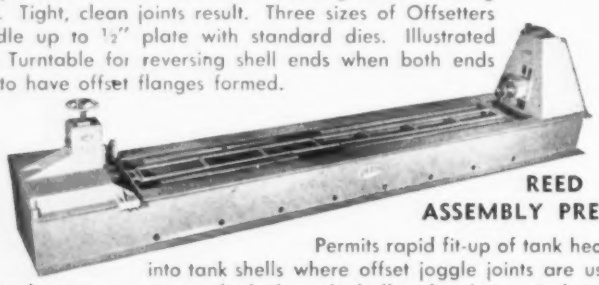
Free-running Trailer — Trailers should require a fairly low surge pull to swing freely at corners. Long leads on the swivel (caster offset) and large ball-bearing swivel plates with a sufficient number of balls, combine to provide a free running trailer.

Since operators have the habit of coupling trailers at sharp angles to the line, ample caster offset and good swivel bearings are even more desirable in tow-line work than in other classes of trailer work.

WEBB TANK PRODUCTION MACHINERY

REED OFFSETTER

This machine forms an offset flange around shell ends to facilitate automatic welding of tank heads. It eliminates chill rings, decreases fit-up time, improves the concentricity of shell ends, and aids in reducing actual welding time. Tight, clean joints result. Three sizes of Offsetters handle up to ½" plate with standard dies. Illustrated with Turntable for reversing shell ends when both ends are to have offset flanges formed.



REED ASSEMBLY PRESS

Permits rapid fit-up of tank heads into tank shells where offset joggle joints are used. Hydraulic pressure is applied through ball-and-socket swivel joints that allow the head cups to set to the head. Hydraulically powered kick-outs speed up loading and unloading. Both headstock and tailstock are adjustable vertically; tailstock is also adjustable along the bed for various lengths of vessels up to 18'.

Fit-up rolls are also available to facilitate proper alignment and assembly of shells lacking rigidity.

Horn Type Fixtures | Cylinder Flange Offsetters | Assembly Fixtures | Unit Type Turning Rolls | Portable Turning Rolls | Automatic Welding Track Supports

WRITE FOR ADDITIONAL INFORMATION

REED EQUIPMENT DIVISION
THE WEBB CORP. WEBB CITY, MO. U. S. A.

Builds Big Vessel

Some 9 ft in diameter, a solid plastic glass reinforced vessel fabricated by Heil Process Equipment Corp., Cleveland, is 14 ft long. Employing standard dished heads and flanged manhole and outlets, the vessel is built to withstand corrosion due to chemicals. Material in the vessel is a product termed Rigidon, a glass reinforced plastic.

Gold-plated Circuits

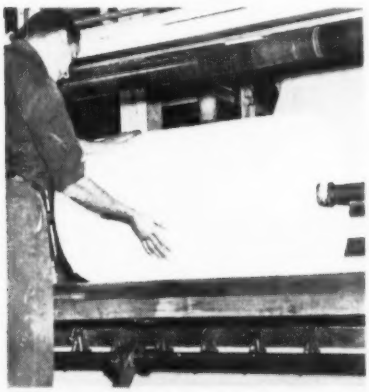
A new acid-type (pH 3.5 to 4.5) gold plating process has been developed especially for printed cir-

cuits. A product of Sel-Rex Corp., Nutley, N. J., the process is mildly acid so that neither the laminate nor the adhesive at the inner-face of printed circuit boards are affected during the plating process. The company reports that the new setup does away with need for a conventional "gold strike" avoiding damage to printed circuit board photo resist by exposure to warm cyanide solutions.

Toss-out Workclothes Like Paper Wipers

How would you like to dispose of your shop workclothing laundry bill by tossing it into the wastebasket? Better still, how would you like to toss the workclothes into the wastebasket? Sound silly? Not so, for it may some day be reality. And into the pile with it you might throw your cloth-like towels, bench coverings which protect delicate parts, cleaning "cloths," etc.

Pointing up the possibility of such future shop items is the recent development of a unique cloth-like material which combines virtues of



Big "parent" rolls later are fabricated into end products.

paper and textiles. A product of Scott Paper Co., Chester, Pa., the material is now in absolutely practical commercial use.

Soft But Lintless — The new product, called Dura-Weve, is soft and absorbent. Yet, it's also strong and durable. It consists of a laminate of rayon scrim material with two or more piles of high wet-strength paper. Substituting other materials (i.e., polyethylene) for one of the paper plies results in still other materials.

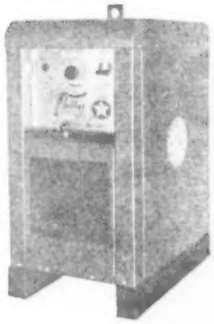
Lint free, the material can be embossed and printed. Thus it can even gain the appearance of loomed fabrics in a variety of designs. Moreover, it comes in bulk in a choice of colors for fabricators to convert to end products.

Launders, Too—Hand towels of this material are not just soft and absorbent, but may be discarded when used, frequently at less cost than laundering a towel of another material. But, even if you should want to launder the product for some reason it will stand up; it doesn't shred or mat in water.

End products of this material can be die-cut, sewed, glued and stapled.

THE 479 DAY TEST:

it's a RECORD!



We knew they were good . . . the trade knew they were good . . . welding engineers knew they were good. But nobody was prepared to forecast that the new Miller line of GOLD STAR welders would erect a startling milestone in welding history . . . in welder performance!

In August, 1956, Miller began production on a new completely sealed semi-metallic rectifier. The date proved to be significant in welding circles. For 479 days later NOT A SINGLE FAILURE HAD BEEN REPORTED FROM THE FIELD!

A new transformer design teamed with the revolutionary completely sealed semi-metallic rectifier led to the introduction of the Miller GOLD STAR series of rectifier type dc and combination ac-dc machines.

Today, weldors everywhere agree that Miller GOLD STAR machines give you:

a. The best welding current ever produced,
b. Record-making dependability.

The 479 day test was made on thousands of Miller GOLD STAR welders working under every conceivable condition—indoors—outdoors—in hundreds of industries.

Here indeed is an all-time record for welder and rectifier reliability.

miller ELECTRIC MANUFACTURING CO., INC.
APPLETON, WISCONSIN
distributed in Canada by CANADIAN LIQUID AIR CO., LTD. Montreal

New Production Ideas

Equipment, Methods and Services

Fork Truck Attachments Reduce Handling Costs

This self-loading, self-dumping scoop for handling molding sand, etc. is only one of many attachments that can help make fork trucks more versatile. Such attachments on a new line of materials handlers may reduce costs for users in machine shops, foundries and metal fabricating plants. The new handlers, cushion-tired fork trucks, come in 6000 to 8000-lb capacities. They are primarily designed with the operator in mind. The maker believes that since the driver is a prime element in lift truck efficiency, that such trucks should be built literally under the operators. Hence, they have extensive "human engineering" features; dimensions, angles, placement of controls and general styling are based on a thorough study of the human form. Power steering is standard equipment. In fact, the line's design gives careful consideration to all physical and visual needs of the operator. (Hyster Co.)

For more data circle No. 39 on postcard, p. 155

Metals Mixing Ladles Feature Many "Extras"

New type high temperature metallurgical mixing ladles for low-carbon chrome production boast many new features. They include a number of attachments not usually seen on steel ladles. The 200 cu ft (inside refractory lining) capacity ladles handle material with a temperature range to 3200 F. They are designed for very efficient operation and handling. Each ladle has a slagging spout on one side, and a square, boxed-in pouring spout on the other. Feet around the center sides and a heart shaped block on the lifting trunnions provide locked, located, support in the transfer and mixing equipment. A removable section of hood closes the top of the ladle completely while in transit to prevent loss of heat. This removable section has openings for burners if needed. (Pennsylvania Engineering Corp.)

For more data circle No. 40 on postcard, p. 155

Back-geared Press Performs Deep Drawing

This new 10-ton press makes use of back gearing to prolong inertial force developed by the oversize flywheel over a long ram stroke and to slow the ram speed. This combination adapts the press to many operations, such as deep drawing, necking, expanding and other jobs where metal flow, rather than shearing, is desirable. Back-geared 10-ton units now come as stock items from one maker in three shut heights: 7¾, 10¾ and 13¾ in. The ram center is 12 in. from the nearest frame member, permitting working to the center of a 24-in. circle. Stroke lengths up to 3-in. maximum are available or special strokes can be supplied on order. Flywheel speeds depend upon motor pulley diameter, usually falling between 40 and 100 rpm, unless otherwise specified. (Benchmaster Mfg. Co.)

For more data circle No. 41 on postcard, p. 155

MACHINING PERFECTION always starts with the right steel

Pick exactly the right steel for any job from J & L's complete cold finished line

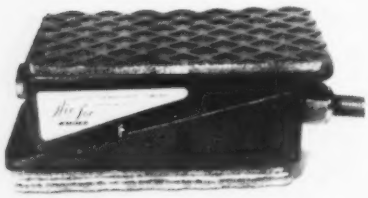
"Increased valve cap production 31% with J & L 1113 Bessemer steel"

This valve cap for drums requires considerable surface machining, drilling and tapping. Comparison test with the previously used open hearth leaded steel shows J&L "1113" leaded Bessemer steel upped production 31% . . . permitted change from a 15-second to a 10⅓-second cycle. Surface finish is smoother. J&L leaded steels assure you higher cutting speeds, longer tool life. Get facts from your distributor or write to Jones & Laughlin, 3 Gateway Center, Pittsburgh 30, Pennsylvania.

J&L STEEL

Jones & Laughlin

. . . a great name in steel



Machinery Mounts Protect Units From Vibration

New type machinery mounts combine vinyl-sisal-cork pads with two adjustable wedges. They absorb vibration and permit instant leveling by the turn of a nut. Adjusting the nut moves two opposing inclined planes. This raises or lowers the machine foot under which the mount is placed. The mount comes in three sizes; 2 x 4 in. to support up to 1000 lb; 3 x 6 in. (2000 lb) and 4 x 8 in. (4000 lb). When installed, mounts are placed in opposite directions. (Clark, Cutler, McDermott Co.)

For more data circle No. 42 on postcard, p. 155

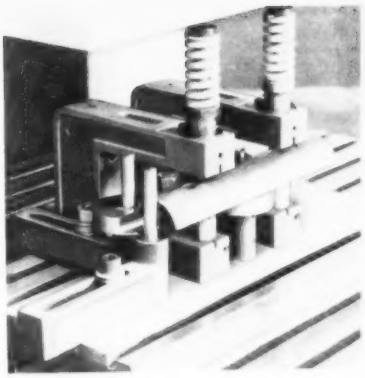
Fork-lift Attachment Handles Odd-size Cartons

For use with one maker's fork trucks, a new multiple-purpose attachment lets the trucks economically handle numerous odd and varied-sized cartons in small quantities without time consuming changing of attachments. Included in the unit are a side shifter, a lift extender, a carton lip, a finger lift and a pair of hinged forks. The multi-handling attachment enables fork truck operators to pick up large or small loads, regardless of shape or size, haul them to various points and unload them in seconds. It is mounted on a 2000-lb chassis with maximum 1000-lb capacity. Overall height, masts nested, is 83 in. It stacks up to 214½ in. on the forks, 234¾ in. with finger lift, and 248 in. to the top of the upper carton lip. (Baker-Raulang Co.)

For more data circle No. 43 on postcard, p. 155

The FOAMING ETCH BLUES
Quick, Joe, dump some more solution from this etching tank! It's foaming so much it's going up the stack and spraying the cars outside.
It's the high concentration of etchant and the high temperature you have to use in your tanks that causes this terrific foaming. Pennsalt Aluminum Etchant 16 will let you operate twenty degrees cooler, and you'll need only half the concentration you're using now.
But remember, Steve, we can't afford to stain or streak these extrusions.
Don't worry about that, Ernie. AE-16® built its reputation on a fine satin etch—and no scale in the tanks, either! Let me send you a drum tomorrow.

Hole Punchers Punch and Rivet Half-rounds



Punching units now available adapt both to punching and riveting half-rounds by use of special interchangeable punches and dies. These units are ordinarily used in punching flanges, webs, and legs of structurals, and extrusions as well as flats up to a capacity of 1.250 in. diam holes in 0.250 in. mild steel. One manufacturer of automotive service tools uses the units in a stamping press setup. These perform rapid multiple piercing of half-round tool parts without deburring. Two units, two stops and a curved bolster between the punching units are mounted to a strip template in a T-slotted bed rail. Nothing is fastened to the ram. Holes are punched in two progressive strokes. (Wales-Strippit Co.)

For more data circle No. 44 on postcard, p. 155

Die-thread Roller Works Simply, Mechanically

This horizontal cylindrical die thread rolling machine is especially suited for high production and job shops. For both in-feed and thru-feed thread and form rolling on large and small production runs, the unit is of the two-die type. It is simple and entirely mechanical in operation. The machine is rugged in construction and is compactly designed. Ease of setup makes possible quick change-over from one job to another. During rolling, one die remains in a fixed position; the other is movable. It's fed into the work by a cam-actuated head which provides for positive control of the feed and size through uniform penetration rates and predetermined length of dwell. Thread lengths up to 1⅞ in. can be rolled by the in-feed method; by the thru-feed method, up to 20 ft. (Reed Rolled Thread Die Co.)

For more data circle No. 45 on postcard, p. 155

You know, Ernie, while Steve Choren from Pennsalt was in yesterday to adjust our phosphating cycle, he looked this over and thought he had the answer.
Let's get him here fast.
A MONTH LATER...
Well, Ernie, how did you make out with the Pennsalt etchant?
Fine, Steve! No more of that annoying foam, no more scale problem in the tanks, and we're getting a fast, clean etch with Pennsalt AE-16. Thanks for pulling me out of a tight spot.

No matter what the metal or the problem, take advantage of Pennsalt's wealth of know-how in metalworking chemistry. Call your Pennsalt salesman or send the coupon to get "A BETTER START FOR YOUR FINISH."

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☐ metal cleaners ☐ phosphate coatings
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35% NICKEL

DURALOY

15% CHROMIUM

Furnace Castings

Here are two good examples of our work in high-nickel castings!

These are in the Duraloy HT group calling for Ni 33.37 percent. We've gone as high as 68% nickel on some castings where extremely high temperatures and very severe corrosive conditions had to be resisted. The important factor concerning castings for exceptionally high temperatures is that they must retain their structural form under load.

Knowing just how much nickel to put in and how much chromium and other alloying elements depends to a large extent on experience . . . and it is experience that we can offer you for the castings you need. We've been producing static castings since 1922 and centrifugal castings since 1933, being among the pioneer founders in each class.

If you would care to have our metallurgist study your casting problem, we shall be glad to have you call upon us for the service.

Our New General Catalog is Yours for the Asking

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NEW EQUIPMENT

Brazing Flux

A new high temperature flux is suitable for brazing steel, stainless steel, nickel alloys, high temperature alloys, copper, tungsten and chromium carbides with silver brazing alloys. It works with torch, induction, air-gas or furnace brazing. Fluidity temperature of the material is reached at 900°F and remains active up to 3000°F, according to its maker. (American Products Corp.)

For more data circle No. 46 on postcard, p. 155

Air Conditioning

A new type high-pressure marine air conditioning and ventilation system conserves on space and weight. Completely integrated, the plant combines air conditioning and ventilation setups. Unlike some low-pressure systems requiring cumbersome space-consuming ductwork, the system uses very small pipes (1¾ to 4¼-in. OD) to transmit treated air at velocities of more than 6000 fpm. It operates with little noise. (Hi-Press Air Conditioning of America, Inc.)

For more data circle No. 47 on postcard, p. 155

Anti-chemical Concrete

Chemical destruction of industrial floors need no longer be a problem to maintenance engineers. So states a developer of a concrete floor material that when applied as a topping over a Portland cement concrete base, it protects against nearly every commercially or commonly processed chemical that ordinarily causes expensive floor replacements and loss of time. (Truscon Laboratories.)

For more data circle No. 48 on postcard, p. 155

Small Lathe

Especially built to handle unusually small electrical armature work, a new lathe features a Dumore grinding attachment for

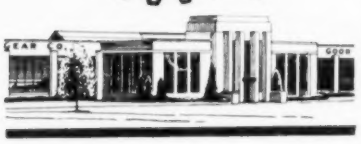
EGYPTIAN DEITIES, Fatimas and Harems

No, these aren't out of Arabian Nights, but were contemporaries of Murads, Condaxes, Richmond Straight Cuts and Sweet Caporals — all popular cigarettes of fifty years ago. Their sale was still illegal in several states, but where you could buy them they cost from 10c to 15c a package of 20 down south (where the popular brands used Virginia tobacco) to 15c to 25c a box of 10 up North (where straight Turkish tobaccos and cork tips were favored). They were a relatively new "fad" and considered by many to be objectionably "sporty".

In the ensuing fifty years the popular attitude towards cigarettes has changed considerably — and so have the cigarettes. As cigarette manufacturers have learned how to improve their product over the years, so have we learned a *lot* more about making better gears than anyone knew back in 1907. In fact, we've made a lot of progress just in the past ten or fifteen years. What about *your* present source of custom gears? A re-examination may show that it will pay you now more than ever to rely on Cincinnati Gear for your custom gear requirements.

THE CINCINNATI GEAR CO.
CINCINNATI 27, OHIO
Fifty Years of "Gears — Good Gears Only"

CINTI ®



plunge-grinding the armature. Utilizing a new method of sizing commutators, the unit was developed after a well-known electric company could not turn armatures on a standard lathe because of two nylon flanges on either side of the short-length commutators. The armature shaft was 1¼-in. long while the width and diameter of the commutator was ¼-in. Due to these small dimensions, it was impossible to bring the cutting tool up against the commutator without striking the shoulder of the flange. This new armature lathe solves such problems by plunge-grinding with a wheel the width of the commutator. (Rivett Lathe & Grinder, Inc.)

For more data circle No. 49 on postcard, p. 155

Laboratory Furnace

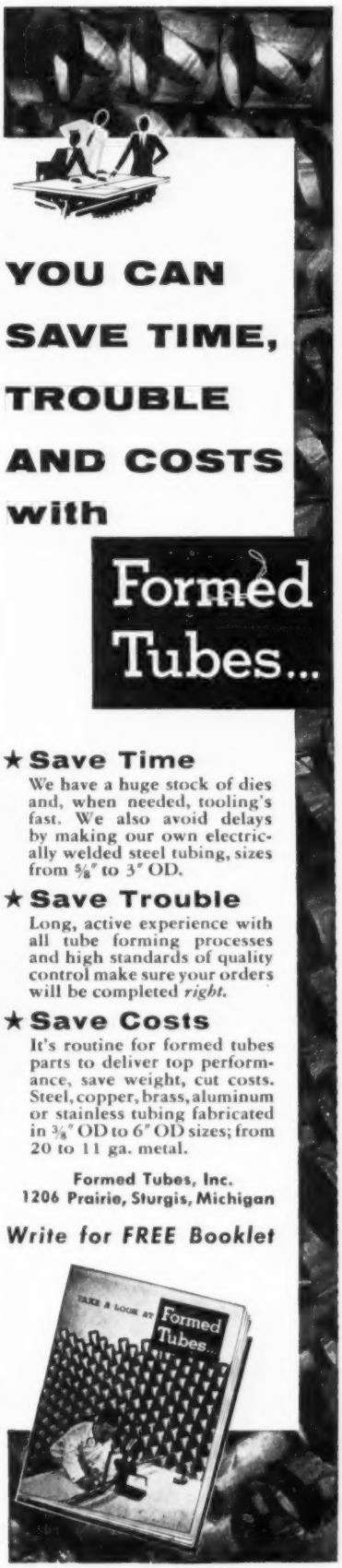
For small melts and sample testing at temperatures to 2650°F, this compact crucible furnace is recommended for laboratory use. Fired by any available fuel gas (natural, manufactured, mixed, or

liquid petroleum gas) and air under low pressure, the furnace is chambered for crucibles up to 15/16-in. base diam x 2¼-in. high. It sells for less than $100 including a gas-air mixing device. (Selas Corp. of America.)

For more data circle No. 50 on postcard, p. 155

Screw-machine Unit

A new cam cut-down slide rule computer works with all Brown & Sharpe automatic screw machines. For use by engineers, draftsmen, price estimators, cam layout men, etc., the computer figures the proper amount of cam cut-down instantly


YOU CAN SAVE TIME, TROUBLE AND COSTS with
Formed Tubes...
★ Save Time
We have a huge stock of dies and, when needed, tooling's fast. We also avoid delays by making our own electrically welded steel tubing, sizes from ⅝" to 3" OD.
★ Save Trouble
Long, active experience with all tube forming processes and high standards of quality control make sure your orders will be completed *right.*
★ Save Costs
It's routine for formed tubes parts to deliver top performance, save weight, cut costs. Steel, copper, brass, aluminum or stainless tubing fabricated in ⅜" OD to 6" OD sizes; from 20 to 11 ga. metal.
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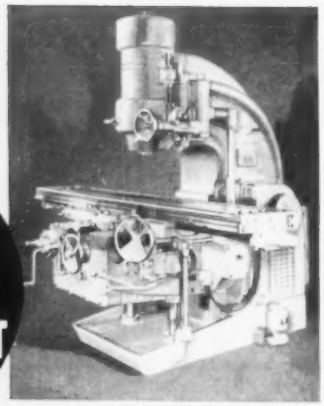

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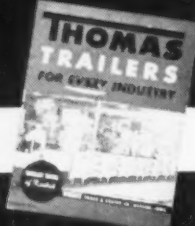

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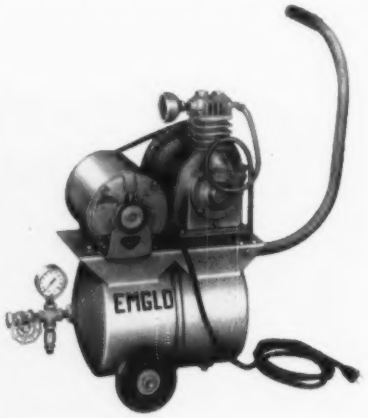
and accurately. It discloses if and by how much the turret tool clears the barend when indexing. And it tells if cam cut-down (alone) or screw adjustment (alone) or a combination of both are needed. Moreover, the computer can tell layout men how much the screw adjustment and cut-down affect length capacity. It is simple in design and easy to read. (Connecticut Automatic Methods Co.)

For more data circle No. 61 on postcard, p. 155

Portable Compressor

This single cylinder piston type compressor is small and portable. Mounted on a 3-gal tank, it's driven by a ⅓-hp motor. The machine produces 100 psi for such jobs as tire inflation, paint spraying, cleaning, operation of air driven tools and cylinders and other compressed air requirements. Furnished with two-wheel portable mounting, it also has a push handle; an 8-ft cord set; a pressure gage; relief, shut-off, and drain valves. (Emglo Products Corp.)



For more data circle No. 62 on postcard, p. 155

Aluminum Valves

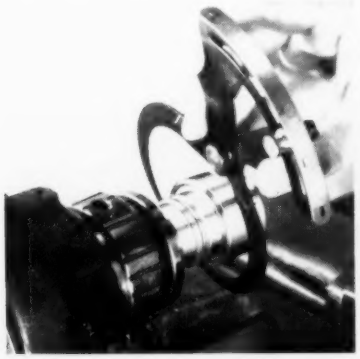
Gate valves of aluminum alloy are now available for general application. After 2½ years of research and development, these valves are currently offered in ½ through 24-in. sizes. They include types for every requirement where

aluminum piping systems are now being used or planned, the manufacturer says. (Darling Valve & Mfg. Co.)

For more data circle No. 63 on postcard, p. 155

Direct-read Caliper

Much measuring time and effort can be saved by using this new direct reading caliper. It not only measures bar stock, sheet stock, and lathe turnings up to 4-in. thick but also castings and moldings of irregular shape that are difficult to measure by other methods. Squeezing the handle opens the caliper; a spring closes it gently on the work. Then the size is read directly on a 0-to-4 in., black-on-white scale, precisely calibrated in inches by 32nd's. It comes in outside and inside models. (Master Specialty Co., Inc.)



For more data circle No. 64 on postcard, p. 155

Color Teflon Tape

Unsintered Teflon tape with color stripes comes in ¼ to 1-in. widths. Uniformity of the laminated stripes is precisely controlled in the manufacture of the tape. Principal use is on items which require insulation or electrical properties of Teflon, combined with a need for color identification. (Bonny Mfg. Corp.)

For more data circle No. 65 on postcard, p. 155

Ball Pein Hammer

Safety is the key feature of a new ball pein hammer. Designed to minimize chipping of critical areas and assure safety for its users, the

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Yes, this new immersion processing machine by Stevens can process up to 40,000 pieces per day – and it has a variety of other uses too.

Ruggedly built, "Little Steve" can be obtained at a surprisingly low initial cost. It is ideal for large or small companies for it will fit many production cycles. It uses an arm as a rack or will take racks for small parts.

Being of small size it offers no floor space or load problems; involves low solution expense and means a small capital investment. It can be used easily as a laboratory testing machine.

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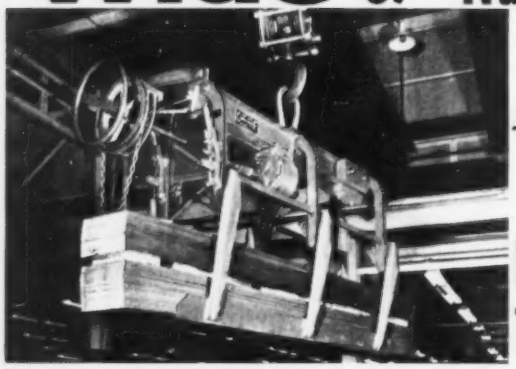

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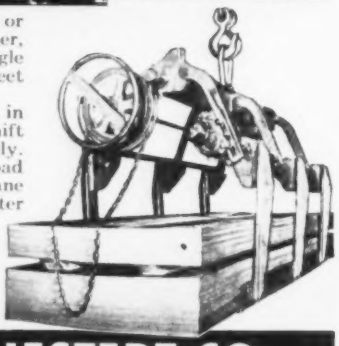
Whether your production requires a few or many widths of sheet steel, 1 C-F Lifter, with its wide range of jaw and carrying angle adjustments will probably meet all your sheet handling requirements.

Adjustments are made by the operator in a few seconds, permitting the Lifter to shift from wide to narrow sizes almost instantly.

Because it can pick up, carry and unload more loads per hour, using less man and crane time than any other method, a C-F Lifter will soon pay for itself.



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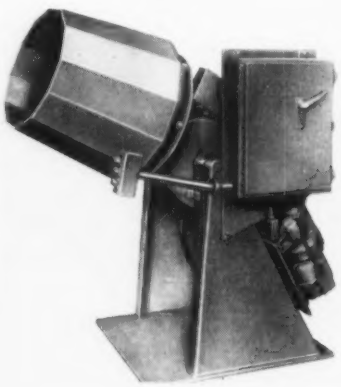
hammer is induction heat-treated on the chamfer to produce a lower degree of hardness on the rim of the hammer face where it is most needed. The face hardness, however, is maintained. (The Stanley Works.)

For more data circle No. 66 on postcard, p. 155

Barrel Finishing

New barrel finishing machines feature complete redesign of pedestals, with new drive and tilting mechanism options to meet production-line requirements. Machines are available in two sizes: No. 1 for barrels 13 to 22 in., and



No. 2 for barrels 22 to 36 in. They may be ordered equipped with either push-button or manual-hydraulic barrel control, and with either vari-speed motor or varisheave drive. These machines may be equipped with the maker's barrels in a full range of sizes and types, or they may be used with standard barrels of other manufacturers. (The Baird Machine Co.)

For more data circle No. 67 on postcard, p. 155

NEW FILMS

"Ideas and Film" illustrates industrial applications of motion pictures. It contains actual examples of telephoto, microscopic, time-lapse, and high-speed cinematography. Included are sequences showing the shattering of a lamp bulb in slow motion, a guided missile from launching to landing, testing a new automobile, and an in-

dustrial time and motion analysis. Color, sound. Available on loan from Bell & Howell dealers or for sale by Tele-Cine Film Studios, 100 S. Northwest Highway, Park Ridge, Ill.

"Honeycomb Repair" demonstrates late techniques of fixing aluminum honeycomb structures under field conditions. It shows two men repairing a 6-inch puncture in an aircraft wing; their tools and materials are all carried in a single cart. 10 min. 16-mm color. Presentations Section, The Martin Co., Baltimore, 3, Md.

"The Big Difference" presents a company's case of why its modern engineered castings are better than "ordinary" castings or weldments. Though it's mainly aimed at designers, it does show some interesting scenes on non-destructive testing, including use of brittle lacquer and electronic strain gages. 16-mm sound, color. Superior Steel & Malleable Castings Co., Benton Harbor, Mich.

"Transflex—Automation in Action" portrays automated press lines which produce automotive wheels. It details a feed mechanism, operation of the press line and the significance of a new press design. 22 min. 16-mm color, sound. Clearing Machine Corp., c/o U. S. Industries, Inc., 6201 W. 63rd St., Chicago 38, Ill.

"Precision Tools in Bottles" tackles the subject of reagents. These are high-purity materials used in research, quality control, etc. 10-min. 16-mm sound, color. Fisher Scientific Co., 362 Fisher Bldg., Pittsburgh 19, Pa.

"Hydraulic Driving Tool Maintenance" deals with care and trouble-shooting procedures for one maker's hydraulic driving tools. These tools drive bolt-type fasteners and blind rivets. 30 min. 16-mm black and white slides. Synchronized sound. Huck Mfg. Co., 2480 Bellevue Ave., Detroit 7, Mich.

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The Iron Age Summary

Mills Launch Drive on Ingot Rate

Industry feels Index is a better barometer of the steel business.

The IRON AGE proposes a way out of dilemma: deletion of defense-standby capacity.

▪ A strong drive to de-emphasize importance of the ingot rate as a barometer of the steel market is under way this week in the steel industry.

The ingot rate may continue to be used during 1958. But steel men will tend to play up the more realistic Index of Steel Production. This Index is based on 1947-49 as 100, whereas the ingot rate base changes from year-to-year as industry capacity increases. Either that or they may seek a new way to express capacity.

Proposed Solution—As a solution to the steel industry's dilemma, The IRON AGE proposed this week that the industry separate its "active" capacity from its so-called "defense-standby" capacity. This would mean a reduction of about 15 pct from present rated capacity. It would shoot today's ingot rate from below 70 pct to above 80 pct.

Ingot capacity will jump from 133.4 million tons on Dec. 31 to about 140 million tons on Jan. 1, 1958. This means that the ingot rate could drop 4-5 points in the first week of the new year even though actual production in tons might be the same as in the previous week.

Distorted Picture — Meanwhile, the heavy holiday shutdowns in steel mills will present a distorted picture that conflicts with the underlying strength of the market. Curtailments from now until the end of the year will be sharp. And January and February will produce little or no improvement.

But the second quarter should show an upturn due to improvement in automotive demand and other seasonal factors. Another bright spot: Forecasts for most of the major industries that buy steel call for a slight improvement in '58 over '57. No drastic cutbacks are expected anywhere.

Inventory Cutbacks — The current slump in steel is due largely to drastic inventory cutbacks by steel users. This may turn out to be a blessing in disguise. If inventory reductions continue at the present pace, the inventory correction may be over much earlier than had been expected. Steel output would then move up in line with actual consumption by industry.

Mills this month are producing fewer tons of steel than they are shipping. One large mill says it will be producing 10-15 pct below its shipping rate. This is a reversal of the situation of several months ago when production was exceeding shipments.

Scrap Market—Steel Scrap prices appear to have hit bottom for the moment. The IRON AGE No. 1 Heavy Melting Composite price held steady at $32 per ton for the third week.

Steel Output, Operating Rates

Production (Net tons, 000 omitted)	This Week 1,741	Last Week 1,770	Month Ago 1,946	Year Ago 2,511
Ingot Index (1947-1949=100)	108.4	110.2	121.1	156.3
Operating Rates				
Chicago	71.0	72.0*	67.0	102.0
Pittsburgh	63.0	66.5	79.0	101.0
Philadelphia	74.0	86.0	86.0	105.0
Valley	56.5	57.0	60.0	99.0
West	80.0	80.0	80.0	101.0
Buffalo	63.5	63.5	83.0	105.0
Cleveland	68.0	67.0*	73.5	100.0
Detroit	81.0	89.0*	90.0	104.0
S. Ohio River	73.0	72.0*	89.0	94.0
South	71.0	67.0	60.5	91.0
Upper Ohio R.	63.0	63.0	71.0	103.0
St. Louis	76.0	60.5	89.0	99.0
Northeast	31.0	31.0*	40.0	100.0
Aggregate	68.0	69.9	76.0	102.0

*Revised

Prices At a Glance

(cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	5.967	5.967	5.967	5.622
Pig Iron (Gross ton)	$66.42	$66.42	$66.42	$63.04
Scrap, No. 1 hvy (Gross ton)	$32.00	$32.00	$32.67	$64.50
No. 2 bundles	$24.00	$24.00	$24.67	$50.83
Nonferrous				
Aluminum ingot	28.10	28.10	28.10	27.10
Copper, electrolytic	27.00	27.00	27.00	40.00
Lead, St. Louis	12.80	12.80	13.30	15.80
Magnesium ingot	36.00	36.00	36.00	36.00
Nickel, electrolytic	74.00	74.00	74.00	64.50
Tin Straits, N. Y.	93.625	92.625*	89.625	102.875
Zinc, E. St. Louis	10.00	10.00	10.00	13.50

Refractories Market Is Soft

Lag in steel operations takes the edge off refractories.

Supply is good, and consumers are getting fast delivery even on special orders.

Despite competitive market, price boost is probable in July because of wage increases.

■ Refractory users face an outlook of prompt supply, higher prices and higher quality.

In supply-and-demand, the lag in steel operations dominates the picture. The mills take 60-70 pct of all refractories. Steel operations are off more than 20 pct from last year's peak and the industry's refractory needs have dropped proportionately. Drastic inventory cuts by the mills have also hurt.

Set for Fast Delivery—Inventory slashes by all customers have put pressure on refractory producers for fast delivery. They are maintaining large stocks of standard brick, making overnight delivery on standard types; filling special orders in two to eight weeks.

Plentiful supply and fast delivery seems sure to continue for the next 12 months. Market forecasts rule out a big increase in the needs of steel and nonferrous users during this period. New installations will be taking fewer refractories as programs of coke oven and aluminum furnace construction are wound up.

Major Expansions—The demand lag hits refractory companies at a time when they have big expansion moves going. H. K. Porter's refractories division is getting into basic brick with new facilities at Pascagoula, Fla. E. & J. Lavino Co. is adding basic facilities at Glassport, Tex.

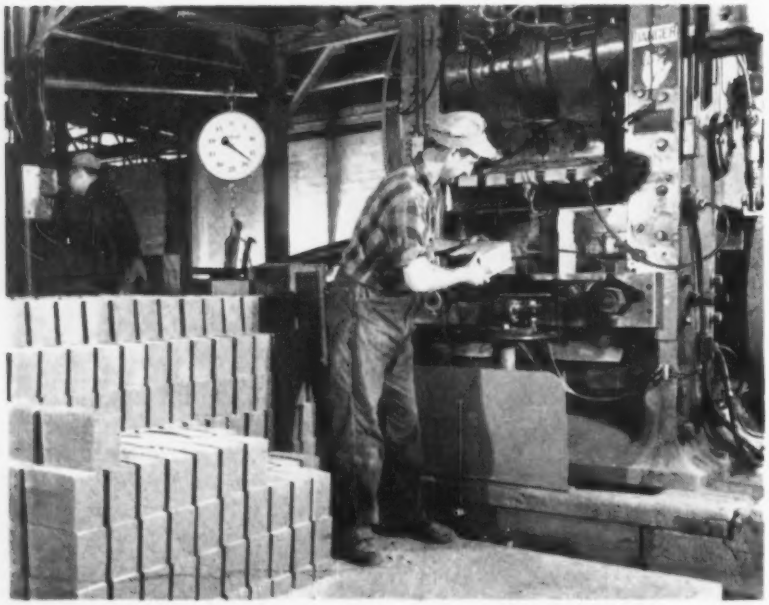
Harbison-Walker has new basic plants at Hammond, Ind., and at Mareland, Quebec. General Refractories has a new basic brick plant at Gary, Ind., and one at Hamilton, Ontario. Kaiser Aluminum & Chemical Corp. opened a basic plant at Columbiana, O., last year.

The big, new emphasis is on basic facilities. It ties in with a trend among users toward better refractories. In past years, basic has been replacing silica brick in the port ends and the regenerator checkers of openhearths. Most recently it has been applied in the main roofs —providing what is called the all-basic construction. There are now 16 all-basic furnaces in operation.

Basic Is Faster — Advantages of these furnaces are faster production and less downtime per ton of steel. Disadvantages are added structural costs initially and higher material costs for each relining.

Trends—Other refractory trends include: Growing use of power-pressed, semi-silica refractories in blast furnace stoves and other steel mill applications, greater emphasis on research and quality control by refractory companies.

Refractory prices will probably go up, next July or sooner. There was an increase of 4-5 pct last April.



BUYERS' MARKET: Brick is loaded on a car for trip through the kiln at Templeton, Pa., works of Harbison-Walker Refractories Co. The plant is making immediate delivery from stock of standard items.

Price Cuts

A price reduction of about 4½ pct has been made on pole-type distribution transformers by General Electric Co. It's described as first sizeable cut in transformer prices since 1938.

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STEEL PRODUCT MARKETS

Auto Sheet Setbacks Worry Mills

Detroit's ordering pattern is keeping steel producers on tenterhooks.

They're not encouraged by the way deferments and cancellations are now coming in from automotive steel buyers.

■ The buzzsaw of cutbacks, cancellations, and deferments from automotive steel buyers continues to cut away at first quarter sheet and bar prospects.

Amid rumblings of auto production cuts, the steel orders from Detroit are either getting shoved back or, in lesser degree, cancelled. With hope diminishing that January might be better than December, the steel mills are now eyeing February books.

As an example of user thinking, one mill reports an automotive customer who normally buys about 6000 tons a month has asked for 1300 in February.

Puzzled Picture—It's hard to get a clear picture of the flat-rolled market for the first quarter. Pushbacks in automotive steel orders one day are followed by advances the next. "There's no regular release of orders anymore," says one sheet man, "just spot releases."

Despite the gloom, sheet producers find a few bright spots in the market. Some users have already put mills on notice they'll want such-and-such tonnage in February and March. Mills take this to mean the buyers are worried about inventories and want to be sure their orders are filled. Another hopeful sign is scattered buying interest from appliance makers. And sales of alloy sheet for missile applications are increasing.

Plate—Users are cutting inventories of sheared mill plate and showing less desire to rush in with first quarter tonnages to the mills. As a result many producers expect to get fully caught up on orders next month. "We'll be more than current by mid-January," says an **Eastern** producer. Mills there with lots of semi-finished steel are keeping rolling operations active but banking openhearth furnaces. Warehouses in both the **East** and the **Midwest** are anxiously trying to unload universal and strip mill plate which they bought in the second and third quarters.

Structurals—It's clear that "recent overdemand for fabricated structural steel is now a thing of the past," according to L. Abbett Post, executive vice president of the American Institute of Steel Construction. Structural bookings for 1957, he told the Maine Highway Conference, will be 3 million tons, while shipments will be 3.5 million tons. He noted that output of heavy structural shapes from the mills in '57 will be 25 pct above 1956 levels for a new record of 6.7 million tons. And by 1959 there will be an additional one million tons available annually as producing mills expand, he added.

Bar — Market is either sliding sideways or drifting downward. Hurting producers are cancellations or setbacks of automotive orders for alloy bar. Mills in the **Midwest** are showing a production falloff in December. Warehouses there are cutting back on ordering. And customers are showing little interest in bar for February and March. Cold finishers are on three-day weeks in that area.

Pipe and Tubing—Overall demand for pipe, with the exception of large linepipe, is down. Mill production on standard and butt-weld product 8 in. and under is declining. Orders from customers come in on a day-to-day basis with delivery almost immediate. Pipe from 10 inch through 16 inch is somewhat better. Mills making these items are going about 16-18 turns a week in the **Cleveland** area.

Wire — Merchant products are continuing poor with buyer interest absent. Manufacturers wire is a little better with automotive orders giving mills some encouragement about the first quarter. A few wire and wire rod customers are expressing interest in February and March tonnages. However, some automotive-related orders have been shoved back from January to February. Wire mills in the **Cleveland** area are expecting to take long holidays during the Christmas season with some possibly closing down for two weeks.

Tinplate — **Pittsburgh** producers are looking for a better market after the first of the year. They base their hopes on fact that user inventories are low. At the moment, however, the mills are still adding to their own inventories despite production cutbacks.

PURCHASING AGENT'S CHECKLIST

Some openings are showing in bookings of large diameter welded pipe. **P. 93**

Deciding whether new equipment is a good buy. **P. 101**

Conditions determine which is best: numerical or tracer machine controls. **P. 119**

COMPARISON OF PRICES

(As Prepared Dec. 17, 1957)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in **Heavy Type**; declines appear in *Italics*.

	Dec. 17 1957	Dec. 10 1957	Nov. 19 1957	Dec. 18 1956
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	4.925¢	4.925¢	4.925¢	4.675¢
Cold-rolled sheets	6.05	6.05	6.05	5.75
Galvanized sheets (10 ga.)	6.60	6.60	6.60	6.30
Hot-rolled strip	4.925	4.925	4.925	4.675
Cold-rolled strip	7.17	7.17	7.17	6.870
Plate	5.12	5.12	5.12	4.87
Plates, wrought iron	13.15	13.15	13.15	10.40
Stainl's C-R strip (No. 302)	52.00	52.00	52.00	47.50
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) coke	$10.30	$10.30	$10.30	$9.95
Tin plates, electro (0.50 lb.)	9.00	9.00	9.00	8.65
Special coated mfg. ternes	9.55	9.55	9.55	9.20
Bars and Shapes: (per pound)				
Merchant bar	5.425¢	5.425¢	5.425¢	5.075¢
Cold finished bars	7.30	7.30	7.30	6.85
Alloy bars	6.475	6.475	6.475	6.125
Structural shapes	5.275	5.275	5.275	5.00
Stainless bars (No. 302)	45.00	45.00	45.00	40¾-43¼
Wrought iron bars	14.45	14.45	14.45	11.50
Wire: (per pound)				
Bright wire	7.65¢	7.65¢	7.65¢	7.20¢
Rails: (per 100 lb.)				
Heavy rails	$5.525	$5.525	$5.525	$5.075
Light rails	6.50	6.50	6.50	6.00
Semifinished Steel: (per net ton)				
Rerolling billets	$77.50	$77.50	$77.50	$74.00
Slabs, rerolling	77.50	77.50	77.50	74.00
Forging billets	96.00	96.00	96.00	91.50
Alloy blooms, billets, slabs	114.00	114.00	114.00	107.00
Wire Rods and Skelp: (per pound)				
Wire rods	6.15¢	6.15¢	6.15¢	5.80¢
Skelp	4.875	4.875	4.875	4.225
Finished Steel Composite: (per pound)				
Base price	5.967¢	5.967¢	5.967¢	5.622¢

	Dec. 17 1957	Dec. 10 1957	Nov. 19 1957	Dec. 18 1956
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$70.51	$70.51	$70.51	$67.76
Foundry, Valley	66.50	66.50	66.50	63.00
Foundry, Southern Cin'ti	71.65	71.65	71.65	67.17
Foundry, Birmingham	62.50	62.50	62.50	59.00
Foundry, Chicago	66.50	66.50	66.50	63.00
Basic, del'd Philadelphia	70.01	70.01	70.01	66.84
Basic, Valley furnace	66.00	66.00	66.00	62.50
Malleable, Chicago	66.50	66.50	66.50	63.00
Malleable, Valley	66.50	66.50	66.50	63.00
Ferromanganese, 74-76 pct Mn, cents per lb‡	12.25	12.25	12.25	11.75-12.75
Pig Iron Composite: (per gross ton)				
Pig iron	$66.42	$66.42	$66.42	$63.04
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$32.50	$32.50	$33.50	$66.50
No. 1 steel, Phila. area	33.00	33.00	33.00	62.50
No. 1 steel, Chicago	30.50	30.50	31.50	64.50
No. 1 bundles, Detroit	21.50	21.50	23.50	60.50
Low phos., Youngstown	33.50	33.50	33.50	70.50
No. 1 mach'y cast, Pittsburgh	50.50	50.50	50.50	61.50
No. 1 mach'y cast, Philadel'a	50.50	50.50	50.50	60.50
No. 1 mach'y cast, Chicago	41.50	40.50	40.50	58.50
Steel Scrap Composite: (per gross ton)				
No. 1 hvy. melting scrap	$32.00	$32.00	$32.67	$64.50
No. 2 bundles	24.00	24.00	24.67	50.83
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$15.38	$15.38	$15.38	$15.50
Foundry coke, prompt	$17.50-$19	$17.50-$19	$17.50-$19	$18-19
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	27.00	27.00	27.00	40.00
Copper, Lake, Conn.	27.00	27.00	27.00	40.00
Tin, Straits, N. Y.	93.625†	92.625*	89.625	102.875
Zinc, East St. Louis	10.00	10.00	10.00	13.50
Lead, St. Louis	12.80	12.80	13.30	15.80
Aluminum, virgin ingot	28.10	28.10	28.10	27.10
Nickel, electrolytic	74.00	74.00	74.00	64.50
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	33.00	33.00	33.00	33.00

† Tentative. ‡ Average. * Revised.

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite

Averages of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

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Bands (1"x⅛"x20' incl. all extras)	7.76	7.98	7.65	7.38
Angles (2"x2"x¼" incl. all extras)	5.98	6.23	6.46	6.10
Beams & Channels (base)	6.43	6.66	6.92	6.56
Furring Channels (C.R. ¾", per 1000')	26.67	27.36	....	....
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Nails (bright, common, 20d and heavier)	8.12	8.32	8.97	8.79
Larssen Sheet Piling (section II, new, incl. size extra)	7.80	8.10	8.10	7.80
Wire, Manufacturer's bright, low C, (11½ ga.)	7.15	7.29	8.29	8.29
Wire, Galv., Fence Qual., Low C (11½ Gauge)	7.68	7.82	9.09	9.09
Wire, Merchant quality, bl. ann., (10 ga.)	7.27	7.42	8.45	8.45
Rope Wire (.045", 247,000 PSI, incl. extras)	13.60	13.75	13.00	13.00
Wire, fine and weaving, low C, (20 ga.)	10.66	10.80	10.17	12.17
Tie Wire, autom. baler (14½ ASWG, 97 lbs. net)	9.58	9.73	9.64	9.54
Merchant Pipe (½" galv. T & C, per 100')	8.48	8.83	....	....
Casing (5½", 15.5 J55, T & C, per 100')	189.00	194.00	....	....
Tubing (2⅞", 6.4 J55, EUE, per 100')	98.00	99.00	....	....
Forged R Turn. Bars, C-1035 (from 10" di.)	13.50	13.73	13.50	13.24

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IRON AND STEEL SCRAP MARKETS

Low Prices Holding For Third Week

Year-end lull finds little activity on the part of dealers or buyers.

Prospects increase for lower export prices after the first of the year.

■ Scrap prices apparently have settled on the market bottom.

Everywhere, the story is the same. Dealers aren't anxious to part with material at current low prices. Few scrap collectors are willing to venture out into the winter weather for the same reason. And fewer mills are willing to buy at any price.

Further evidence that scrap prices are going nowhere for a while is the declining mill operating rate plus the oncoming holiday season.

The few swirls of activity in the domestic market were restricted to limited foundry purchases of cast grades and broker buying of railroad specialties.

Even export, which has been helping the port districts keep the wolf away from the door, is slackening. Some trade sources predict that export won't be improving after the first of the year.

Foreign buyers are expected to put the pressure on for lower prices. The slowdown in the U. S. economy will be felt sooner or later in European markets and it may be reflected in further slackening of export demand for scrap.

Meanwhile, The IRON AGE Composite Price for No. 1 heavy steelmaking scrap held steady at $32 for the third straight week.

Pittsburgh — Prices of dealer openhearth grades are unchanged as small purchases by a local mill show no further weakening. A price of $29 seems to be rock bottom for No. 2 bundles. Railroad specialties and 2-ft rails are off $1, but the overall railroad market remains surprisingly strong. On a late list, No. 1 railroad heavy melting brought nearly $1 more than it had on an earlier offering. The price of No. 1 factory bundles is down $1 and brokers expect new lists will show further slides.

Chicago — Scrap continues to dwindle in supply. Lower offers from mills are being turned away by scrap suppliers. The downward drop seems to be frozen solid by a combination of cold weather and a falling rate of industrial scrap output. Cast prices are stiffening, particularly outside the metropolitan area where broker buying has hit as high as $45. The effect has been to squeeze upward broker buying prices of several grades, though consumers remain unaffected so far.

Philadelphia — Demand from local mills continues weak and there is little prospect of change for the balance of the year. Export activity is moderate though at a slower pace than in previous months. Spot purchases of No. 1 heavy melting and No. 2 bundles were reported at higher than quoted prices. However, these sales apparently were limited.

New York—Slim export orders continue to prop this market. Some brokers are still filling a small order from a consumer in an adjacent district. But otherwise exporters have the market to themselves. Little improvement is expected until after the holidays.

Detroit — Complete inactivity describes this market. Dealers are just marking time. At this late date there is little chance that local mills will buy scrap before the end of the year.

Cleveland — The market continues dull with no sizable new orders out and none in sight. Prices are unchanged and mills show no interest in buying. Dealers continue to hold prime grades and search for out-of-town markets for their secondary grades. Foundries are buying small tonnages because of favorable price over pig iron.

St. Louis—This market seems at a standstill. Dealers receipts are light and they are holding what they have in hope of higher prices.

Birmingham—There was some buying of cast scrap here, but quantities were little more than tokens and were scattered among several foundries. They apparently were testing the supply by increasing the price of No. 1 cast $1 a ton.

Cincinnati — Some cast iron is moving south, but industrial scrap is the only steelmaking grade showing activity. Little change in the market is expected until early next year.

Buffalo—Business has come to a halt in this market. Prices of all grades are off $1 on appraisal. Scrap intake at dealer yards has slowed to a trickle. Even industrial scrap intake is declining because of less activity in plants.

Boston — The market is just drifting. Mills remain out of the market. Export is dead. Prices are unchanged.

West Coast—This market is in the doldrums. Mills aren't ordering much to speak of. And they are getting what little they want without any trouble. There is no real test of prices.

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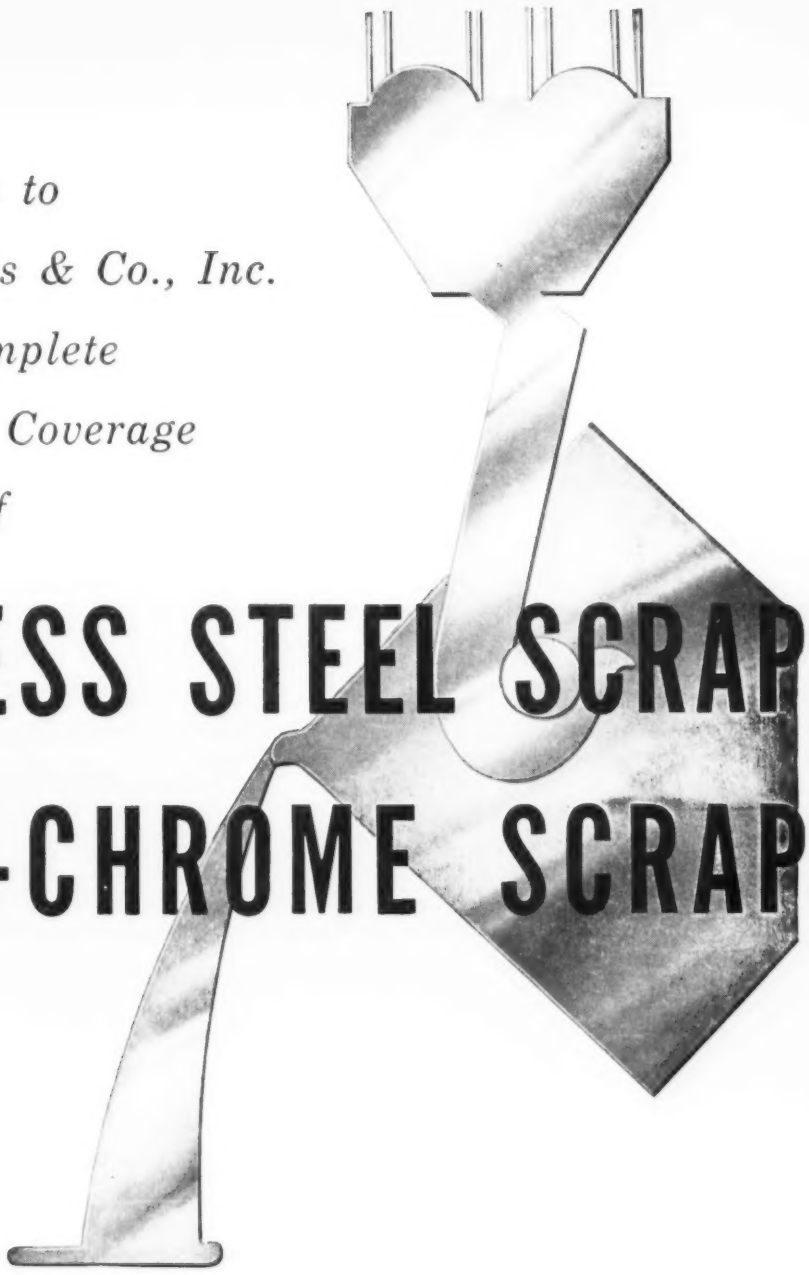

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SCRAP PRICES *(Effective Dec. 17, 1957)*

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$32.00 to $33.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 dealer bundles	32.00 to 33.00
No. 1 factory bundles	34.00 to 35.00
No. 2 bundles	28.00 to 29.00
No. 1 busheling	32.00 to 33.00
Machine shop turn	16.00 to 17.00
Mixed bor. and turn	16.00 to 17.00
Shoveling turnings	20.00 to 21.00
Cast iron boring	20.00 to 21.00
Low phos. punchings plate	35.00 to 36.00
Heavy turnings	31.00 to 32.00
No. 1 RR hvy. melting	36.00 to 37.00
Scrap rails, random lgth	17.00 to 18.00
Rails 2 ft and under	55.00 to 56.00
RR steel wheels	45.00 to 46.00
RR spring steel	45.00 to 46.00
RR couplers and knuckles	45.00 to 46.00
No. 1 machinery cast	50.00 to 51.00
Cupola cast	39.00 to 40.00
Heavy breakable cast	37.00 to 38.00

Chicago

No. 1 hvy. melting	$30.00 to $31.00
No. 2 hvy. melting	28.00 to 29.00
No. 1 dealer bundles	30.00 to 31.00
No. 1 factory bundles	35.00 to 36.00
No. 2 bundles	19.00 to 20.00
No. 1 busheling	30.00 to 31.00
Machine shop turn	15.00 to 16.00
Mixed bor. and turn	17.00 to 18.00
Shoveling turnings	17.00 to 18.00
Cast iron borings	17.00 to 18.00
Low phos. forge crops	43.00 to 44.00
Low phos. punch'gs plate	29.00 to 30.00
Low phos. 3 ft and under	38.00 to 39.00
No. 1 RR hvy. melting	35.00 to 36.00
Scrap rails, random lgth	41.00 to 42.00
Rerolling rails	48.00 to 49.00
Rails 2 ft and under	47.00 to 48.00
Locomotive tires cut	43.00 to 44.00
Cut bolsters & side frames	40.00 to 41.00
Angles and splice bars	45.00 to 46.00
RR steel car axles	48.00 to 49.00
RR couplers and knuckles	42.00 to 43.00
No. 1 machinery cast	41.00 to 42.00
Cupola cast	36.00 to 37.00
Heavy breakable cast	34.00 to 35.00
Cast iron brake shoe	35.00 to 36.00
Cast iron wheels	40.00 to 41.00
Malleable	47.00 to 48.00
Stove plate	34.00 to 35.00
Steel car wheels	44.00 to 45.00

Philadelphia Area

No. 1 hvy. melting	$32.50 to $33.50
No. 2 hvy. melting	29.50 to 30.50
No. 1 dealer bundles	32.50 to 33.50
No. 2 bundles	23.50 to 24.50
No. 1 busheling	32.50 to 33.50
Machine shop turn	18.00 to 19.00
Mixed bor. short turn	22.00 to 23.00
Cast iron borings	22.00 to 23.00
Shoveling turnings	22.00 to 23.00
Clean cast chem. borings	30.00 to 31.00
Low phos. 5 ft and under	39.00 to 40.00
Low phos. 2 ft and under	40.00 to 41.00
Low phos. punchings	40.00 to 41.00
Elec. furnace bundles	36.00 to 37.00
Heavy turnings	30.00 to 31.00
RR steel wheels	45.00 to 46.00
RR spring steel	45.00 to 46.00
Rails 18 in. and under	63.00 to 64.00
Cupola cast	36.00 to 38.00
Heavy breakable cast	36.00 to 37.00
Cast iron car wheels	40.00 to 41.00
Malleable	55.00 to 56.00
Unstripped motor blocks	32.00 to 33.00
No. 1 machinery cast	50.00 to 51.00

Cleveland

No. 1 hvy. melting	$27.00 to $28.00
No. 2 hvy. melting	21.00 to 22.00
No. 1 dealer bundles	27.00 to 28.00
No. 1 factory bundles	31.00 to 32.00
No. 2 bundles	20.00 to 21.00
No. 1 busheling	27.00 to 28.00
Machine shop turn	10.00 to 11.00
Mixed bor. and turn	14.00 to 15.00
Shoveling turnings	14.00 to 15.00
Cast iron borings	14.00 to 15.00
Cut struct'l & plates, 2 ft & under	35.00 to 36.00
Drop forge flashings	27.00 to 28.00
Low phos. punch'gs, plate	28.00 to 29.00
Foundry steel, 2 ft & under	33.00 to 34.00
No. 1 RR heavy melting	32.00 to 33.00
Rails 2 ft and under	53.00 to 54.00
Rails 18 in. and under	54.00 to 55.00
Railroad grate bars	14.00 to 15.00
Steel axle turnings	15.00 to 16.00
Railroad cast	42.00 to 43.00
No. 1 machinery cast	44.00 to 45.00
Stove plate	40.00 to 41.00
Malleable	54.00 to 55.00

Youngstown

No. 1 hvy. melting	$30.00 to $31.00
No. 2 hvy. melting	24.00 to 25.00
No. 1 dealer bundles	30.00 to 31.00
No. 2 bundles	23.00 to 24.00
Machine shop turn	13.00 to 14.00
Shoveling turnings	17.00 to 18.00
Cast iron borings	17.00 to 18.00
Low phos. plate	33.00 to 34.00

Buffalo

No. 1 hvy. melting	$28.00 to $29.00
No. 2 hvy. melting	25.50 to 26.50
No. 1 busheling	28.00 to 29.00
No. 1 dealer bundles	28.00 to 29.00
No. 2 bundles	22.50 to 23.50
Machine shop turn	12.00 to 13.00
Mixed bor. and turn	13.00 to 14.00
Shoveling turnings	15.00 to 16.00
Cast iron borings	14.00 to 15.00
Low phos. plate	34.00 to 35.00
Scrap rails, random lgth	40.00 to 41.00
Rails 2 ft and under	50.00 to 51.00
RR steel wheels	37.00 to 38.00
RR spring steel	33.00 to 34.00
RR couplers and knucklers	33.00 to 34.00
No. 1 machinery cast	40.00 to 41.00
No. 1 cupola cast	35.00 to 36.00

Detroit

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$21.00 to $22.00
No. 2 hvy. melting	18.00 to 19.00
No. 1 dealer bundles	21.00 to 22.00
No. 2 bundles	16.00 to 17.00
No. 1 busheling	20.00 to 21.00
Drop forge flashings	20.00 to 21.00
Machine shop turn	8.00 to 9.00
Mixed bor. and turn	10.00 to 11.00
Shoveling turnings	10.00 to 11.00
Cast iron borings	10.00 to 11.00
Low phos. punch'gs plate	21.00 to 22.00
No. 1 cupola cast	29.00 to 30.00
Heavy breakable cast	24.00 to 25.00
Stove plate	24.00 to 25.00
Automotive cast	32.00 to 33.00

St. Louis

No. 1 hvy. melting	$37.00 to $38.00
No. 2 hvy. melting	34.00 to 35.00
No. 1 dealer bundles	37.00 to 38.00
No. 2 bundles	26.00 to 27.00
Machine shop turn	16.00 to 17.00
Cast iron borings	18.00 to 19.00
Shoveling turnings	18.00 to 19.00
No. 1 RR hvy. melting	38.50 to 39.50
Rails, random lengths	42.00 to 43.00
Rails, 18 in. and under	48.00 to 49.00
Angles and splice bars	40.00 to 41.00
Std. steel car axles	44.00 to 45.00
RR specialties	43.00 to 44.00
Cupola cast	42.00 to 43.00
Heavy breakable cast	35.00 to 36.00
Cast iron brake shoes	37.00 to 38.00
Stove plate	36.50 to 37.50
Cast iron car wheels	32.00 to 33.00
Rerolling rails	46.00 to 47.00
Unstripped motor blocks	32.00 to 33.00

Boston

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$23.00 to $24.00
No. 2 hvy. melting	20.00 to 21.00
No. 1 dealer bundles	23.00 to 24.00
No. 2 bundles	15.00 to 16.00
No. 1 busheling	22.00 to 24.00
Elec. furnace, 3 ft & under	29.00 to 30.00
Machine shop turn	8.50 to 9.50
Mixed bor. and short turn	9.50 to 10.50
Shoveling turnings	10.00 to 11.00
Clean cast chem. borings	16.00 to 17.00
No. 1 machinery cast	34.00 to 35.00
Mixed cupola cast	27.00 to 28.00
Heavy breakable cast	25.00 to 26.00
Stove plate	26.00 to 27.00
Unstripped motor blocks	27.00 to 28.00

New York

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$30.00 to $31.00
No. 2 hvy. melting	26.00 to 27.00
No. 2 dealer bundles	19.00 to 20.00
Machine shop turn	11.00 to 12.00
Mixed bor. and turn	13.00 to 14.00
Shoveling turnings	15.00 to 16.00
Clean cast, chem. borings	23.00 to 24.00
No. 1 machinery cast	34.00 to 35.00
Mixed yard cast	29.00 to 30.00
Charging box cast	30.00 to 31.00
Heavy breakable cast	30.00 to 31.00
Unstripped motor blocks	27.00 to 28.00

Birmingham

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	24.00 to 25.00
No. 1 dealer bundles	29.00 to 30.00
No. 2 bundles	16.00 to 17.00
No. 1 busheling	29.00 to 30.00
Machine shop turn	20.00 to 21.00
Shoveling turnings	21.00 to 22.00
Cast iron borings	12.00 to 13.00
Electric furnace bundles	35.00 to 36.00
Elec. furnace, 3 ft & under	33.00 to 34.00
Bar crops and plate	38.00 to 39.00
Structural and plate, 2 ft	38.00 to 39.00
No. 1 RR hvy. melting	34.00 to 35.00
Scrap rails, random lgth	41.00 to 42.00
Rails, 18 in. and under	48.00 to 49.00
Angles & splice bars	40.00 to 41.00
Rerolling rails	47.00 to 48.00
No. 1 cupola cast	48.00 to 49.00
Stove plate	47.00 to 48.00
Charging box cast	22.00 to 23.00
Cast iron car wheels	36.00 to 37.00
Unstripped motor blocks	38.00 to 39.00

Cincinnati

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	24.00 to 25.00
No. 1 dealer bundles	29.00 to 30.00
No. 2 bundles	20.00 to 21.00
Machine shop turn	14.00 to 15.00
Mixed bor. and turn	17.00 to 18.00
Shoveling turnings	17.00 to 18.00
Cast iron borings	17.00 to 18.00
Low phos., 18 in. and under	37.00 to 38.00
Rails, random length	42.00 to 43.00
Rails, 18 in. and under	52.00 to 53.00
No. 1 cupola cast	36.00 to 37.00
Hvy. breakable cast	32.00 to 33.00
Drop broken cast	47.00 to 48.00

San Francisco

No. 1 hvy. melting	$26.00
No. 2 hvy. melting	24.00
No. 1 dealer bundles	24.00
No. 2 bundles	20.00
Machine shop turn	20.00
Cast iron borings	20.00
No. 1 RR hvy. melting	36.00
No. 1 cupola cast	45.00

Los Angeles

No. 1 hvy. melting	$26.00
No. 2 hvy. melting	24.00
No. 1 dealer bundles	32.00
No. 2 bundles	24.00
Machine shop turn	15.00
Shoveling turnings	18.00
Cast iron borings	18.00
Elec. furn. 1 ft and under (foundry)	47.00
No. 1 RR hvy. melting	29.00
No. 1 cupola cast	42.00

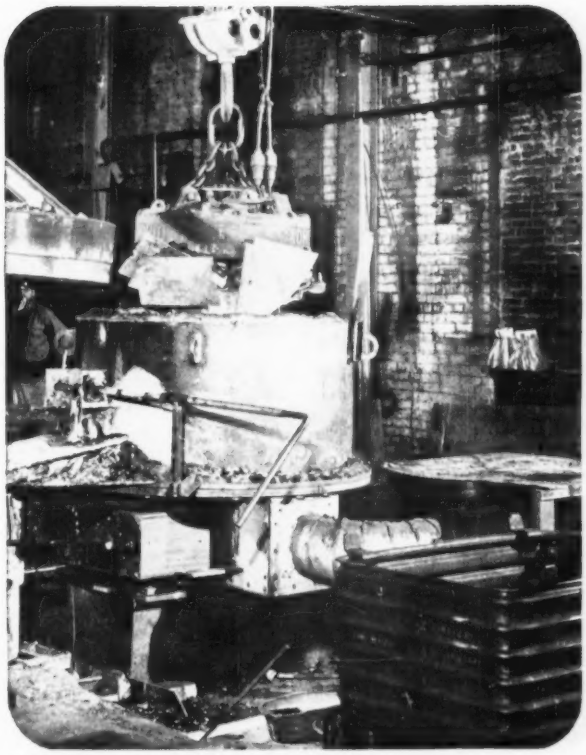
Seattle

No. 1 hvy. melting	$24.00
No. 2 hvy. melting	22.00
No. 2 bundles	26.00
No. 1 cupola cast	38.00
Mixed yard cast	38.00

Hamilton, Ont.

No. 1 hvy. melting	$24.00
No. 2 hvy. melting	22.00
No. 1 dealer bundles	24.00
No. 2 bundles	24.00
Mixed steel scrap	28.00
Busheling	24.00
Bush., new fact, prep'd	24.00
Bush., new fact, unprep'd	28.00
Machine shop turn	19.00
Short steel turn	23.00
Mixed bor. and turn	19.00
Rails, rerolling	42.00
Cast scrap	$44.00 to 49.00

5 ways to make your foundry more efficient with OHIO MAGNETS

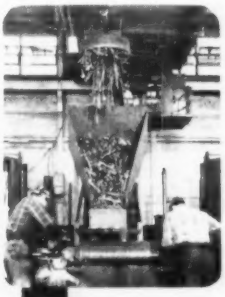


1 CHARGING FURNACE. One 36-inch Ohio Bolted Magnet charges six 375 KW furnaces giving 240 500-pound heats each 24 hours.

2 SCRAP HANDLING. All scrap is handled efficiently, economically with Ohio Magnet. Single 36-inch magnet replaces grapple, clamshell, bucket or lift truck.

3 SORTING. Castings are conveyed from Wheelabrator to hard-iron inspection. Ohio Magnet picks parts out of sorting bins.

4 UNLOADING ANNEALING FURNACE now takes one man 10 to 20 minutes with Ohio Magnet. Lift truck used to take 1 to 2 hours.



5 LOADING GRINDING HOPPER after conveying parts from inspection department. Same Ohio Magnet is used for operations shown in photos 3, 4 and 5.

Photos: Courtesy I-F Manufacturing Company, New Philadelphia, Ohio

Ohio ELECTRIC

CHESTER BLAND
President

Small foundry or large, magnetic materials handling points the way to higher productivity, higher efficiency. And with Ohio Magnets on the job you get high availability, too. That's because Ohio Magnets are built with that extra margin of safety that means long, service-free life. Yes, *magnetic materials handling pays—especially with Ohio Magnets.*

THE OHIO ELECTRIC MFG. CO.
5400 Dunham Road • Maple Heights • Ohio

AA-3333

NONFERROUS MARKETS

Tariffs Loom as Big Issue in 1958

The only agreement on tariffs is that they should be moved.

Producers say to stay healthy they must be protected from foreign competition.

Those with international interests say higher tariffs will jeopardize our chances for overseas missile bases.

■ The Christmas holidays will be a lull before the storm in many nonferrous and government circles. The issues are tariffs and import quotas.

It's not a new problem. But this time it looks like someone (other than just foreign producers) is going to feel short-changed no matter what happens.

The only agreement seems to be that no one likes tariff levels where they are now. Arguments for moving them in either direction are strong.

Arguments for Lower Tariffs—Simplified, here's the way the battle stacks up. On one side of the fence, U. S. international diplomats, representatives of foreign governments, and U. S. companies with foreign connections want lower tariffs. They say it can be done selectively, without damaging American industry. They point out that we are now seeking missile bases in foreign countries. We must offer something in return, e.g., an economic boost by providing a more attractive market for foreign products. To raise tariffs at this time, they insist, would endanger close ties with our allies.

On the other side of the fence, many U. S. producers say that if the government wants a healthy domestic industry, it must be protected from foreign competitors with lower cost factors.

Administration Program—And so the wheels turn. The Administration has come out for a liberal international trade policy leaving room to protect American industry when necessary. It is formulating a program which it hopes will be enacted by the next session of Congress. Key items are (1) additional authority to cut tariffs and duties up to 25 pct of the existing rate. Current maximum is 15 pct. (2) Right to raise tariffs by 50 pct of the 1934 rate, when tariffs were higher than the present base year, 1945. (3) Extension of the Reciprocal Trade Agreements Act for another five years.

The White House is seeking to win over some of the protectionists by shifting responsibility for the administration of tariffs and quotas to the Commerce Dept. from the State Dept. The idea is to nullify claims that the people in charge are more interested in international politics than American industry.

Commerce Committee — The Commerce Dept. will bid for industry support by setting up a 60-man committee of industry representatives to meet periodically to advise on the administration of trade laws.

The U. S. Tariff Commission is now studying the case made by the U. S. zinc and lead producers. The new year won't be very old before its recommendations are on the desk of the President. If Mr. Eisenhower acts favorably to U. S. industry the Commission must be ready to handle a sudden influx of requests from nonferrous industries which want the same thing. Tungsten, copper and brass, and titanium industries make no secret of the fact that they are now preparing their respective cases.

Union Guns Ready—Unions are starting to line up their big guns to support domestic producers. The latest is the International Union of Mine, Mill and Smelter Workers. The group will mount an all-out campaign for higher tariffs and a quota on imports of brass products. The reason: They say imports are causing increased unemployment in U. S. brass mills and copper mines, and smelters.

Efforts are being made by some arms of the Administration to take the sting out of any tariff boosts that might be made. Top level defense planners are studying a State Dept. proposal to suspend the import duty on primary nickel should the tariff on lead and zinc be increased. The idea is to appease Canada.

Power for the President—The Defense Mobilization Board has twice discussed the plan behind closed doors. Unless DMB overrules it, State Dept. will ask Congress to give the President the power to suspend the duty.

S. 1544, submitted by Sen. Dennis Chavez (D., N.M.) would repeal the import duty on nickel. But the State Dept. would prefer to do things its way.

Primary Prices

cents per lb	Current price	last price	date of change
Aluminum pig	26.00	25.00	8 1 57
Aluminum ingot	28.10	27.10	8 1 57
Copper (E)	27.00	28.50	9 3 57
Copper (CS)	25.50	25.00	12 16 57
Copper (L)	27.00	28.50	9 3 57
Lead, St. L.	12.80	13.30	12 2 57
Lead, N. Y.	13.00	13.50	12 2 57
Magnesium ingot	36.00	34.09	8 13 56
Magnesium pig	35.25	33.75	8 13 56
Nickel	74.00	64.50	12 6 56
Titanium sponge	165-250	165-225	5 5 57
Zinc, E. St. L.	10.00	10.50	7 1 57
Zinc, N. Y.	10.50	11.00	7 1 57

ALUMINUM: 99% ingot frt allwd. **COPPER**: (**E**) = electrolytic, (**CS**) = custom smelters, electrolytic, (**L**) = lake. **LEAD**: common grade. **MAGNESIUM**: 99.8% pig, Velasco, Tex. **NICKEL**: Port Colbourne, Canada. **ZINC**: prime western. **TIN**: see right; other primary prices, pg. 186.

Magnesium

Sen. Kefauver (D., Tenn.), in his capacity as chairman of the Senate Antitrust and Monopoly Subcommittee, is not happy with the sale of the government-owned magnesium plant at Velasco, Tex., to Dow Chemical Co.

His ire is directed against General Services Administration for making the sale against the advice of the Justice Dept. Sen. Kefauver called the move by GSA Administrator Franklin G. Floete "extremely shortsighted," and declared the acquisition would "solidify Dow's present monopoly for years to come."

Dow Highest Bidder — GSA agreed to accept Dow's bid for the plant, which Dow built for the government and has operated since 1942. It was the highest bid. The price was $20.7 million.

Sen. Kefauver said that if an alternative satisfactory bid could not be found GSA should have continued to lease the facilities.

Lease?—At the time of the sale it had been rumored, and not denied by either Dow or GSA, that the company was seriously considering not renewing its lease on Velasco.

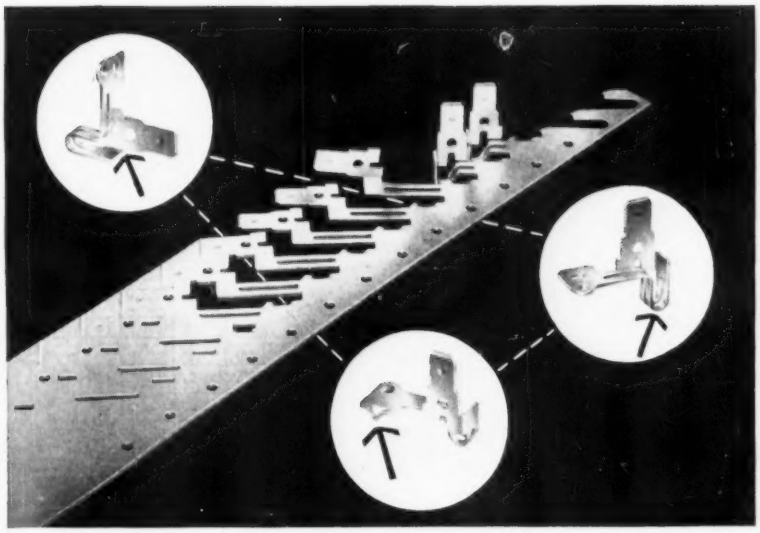
Tin

Reports from Singapore indicate no time is being wasted in applying the International Tin Council export quotas. Although no official figure is published, major buyers estimate less tin was sold than is normal for this time. The price went up about 1½¢ per lb.

The New York market remains confused. No one has yet taken a definite stand on what effect the ITC quotas will have. There were more futures sellers, which tended to soften this market.

Tin prices for the week: Dec. 11—92.50; Dec. 12—92.375; Dec. 13—93.00; Dec. 16—93.50; Dec. 17—93.625.*

*Estimate.



Cut costs on tough forming jobs with Elephant Brand®
fine grain **phosphor bronze**

Automatic metal-forming machines operate best when they are fed materials of uniform, dependable quality. To shape critical details like those shown on these switch parts, many manufacturers rely on Seymour ELEPHANT BRAND phosphor bronze. Its fine grain permits making sharp bends, severe draws and other complex forming operations with a minimum of rejections or tooling adjustments.

Seymour ELEPHANT BRAND combines in one fine grain phosphor bronze alloy: high ductility, great strength, uniform temper, long fatigue life, and fine finish. These qualities prompt discerning users to say:—"Specify Seymour ELEPHANT BRAND . . . there's no finer phosphor bronze!"

ALL ELEPHANT BRAND phosphor bronze is fine grain

The first phosphor bronze produced in the U.S. was ELEPHANT BRAND. Made by a carefully guarded process which insures the highest degree of purity and uniformity, it has a grain structure of very fine, uniform crystals free from segregation, coring or residual dendritic structure. Thus, ELEPHANT BRAND is a quality standard as well as a trade-mark for the original and finest phosphor bronze.

Your Seymour Representative is trained to help you solve metals problems. Why not call him today?

THE SEYMOUR MANUFACTURING COMPANY

2 FRANKLIN ST., SEYMOUR, CONNECTICUT

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. ship. pt., frt. allowed)

Flat Sheet (Mill Finish) and Plate

("F" temper except 6061-0)

Alloy	032	081	136-249	250-3
1100, 3003	46.6	44.3	43.6	42.7
5052	54.0	48.9	47.2	45.4
6061-0	51.4	47.0	45.2	45.1

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
6-8	45.0-46.8	60.4-64.1
12-14	45.7-47.2	61.3-65.8
24-26	49.0-49.5	72.1-76.8
36-38	58.0-58.6	96.2-99.8

Screw Machine Stock—2011-T-3

Size"	¼	⅝-⅞	⅞-1	1¼-1½
Price	63.0	62.5	61.0	58.6

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length" →	72	96	120	144
.019 gage	$1.420	$1.893	$2.367	$2.839
.024 gage	1.774	2.366	2.957	3.549

MAGNESIUM

(F.o.b. shipping Pt., carload frt. allowed)

Sheet and Plate

Type ↓ Gage →	250 3.00	250 2.00	188	081	032
AZ31B Stand. Grade		67.9	69.0	77.9	108.1
AZ31B Spec.		93.3	95.7	108.7	171.3
Tread Plate		70.6	71.7		
Tooling Plate	73.0				

Extruded Shapes

factor →	6-8	12-14	24-26	36-38
Comm. Grade (AZ31C)	69.6	70.7	75.6	89.2
Spec. Grade (AZ31B)	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting) 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices, f.o.b. mill)

	V Nickel	Monel	Inconel
Sheet, CR	128	106	128
Strip, CR	124	108	128
Rod, Anld, HR	107	89	109
Angles, HR	107	89	109
Plates, HR	120	103	121
Seamless Tube	137	129	200
Shot, Blocks		87	

COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Red	Tube
Copper	50.13	.....	47.36	50.32
Brass, 70/30	44.02	44.56	45.26	46.93
Brass, Low	46.50	47.04	46.44	49.31
Brass, R.L.	47.37	47.91	47.31	50.18
Brass, Naval	48.27	.....	42.58	51.68
Munts Metal	46.39	.....	42.20	.....
Comm. Bs.	48.78	49.32	48.72	51.34
Mang. Bs.	52.01	.....	46.11	.....
Phos. Bs. 5%	69.07	.....	69.57	.....

Free Cutting Brass Rod 32.50

TITANIUM

(10,000 lb base, f.o.b. mill)

Sheet and strip, commercially pure, $9.50-$10.60; alloy, $14.75; Plate, HR, commercially pure, $8.00-$8.75; alloy, $10.75. Wire, rolled and/or drawn, commercially pure, $7.50-$8.00; alloy $10.00; Bar, HR or forged, commercially pure, $6.15-$6.40; alloy, $6.15-$6.35; billets, HR, commercially pure, $6.00-$6.25; alloy, $6.90-$6.20.

PRIMARY METAL

(Cents per lb unless otherwise noted)

Antimony, American, Laredo, Tex. 33.50
Beryllium aluminum 5% Be, Dollar per lb contained Be $74.75
Beryllium copper, per lb cont'd Be $43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading $71.50
Bismuth, ton lots $2.25
Cadmium, del'd $1.70
Calcium, 99.9% small lots $4.55
Chromium, 99.8% metallic basis $1.31
Cobalt, 97-99% (per lb) ..... $2.00 to $2.07
Germanium, per gm, f.o.b. Miami, Okla., refined ..... 39.50 to 53.50
Gold, U. S. Treas, per troy oz $35.00
Indium, 99.9%, dollars per troy oz. $2.25
Iridium, dollars per troy oz. ..... $80 to $90
Lithium, 98% ..... $11.00 to $14.00
Magnesium, sticks, 100 to 500 lb. 59.00
Mercury, dollars per 76-lb flask, f.o.b. New York ..... $225 to $230
Nickel oxide sinter at Copper Cliff, Ont., contained nickel 71.25
Palladium, dollars per troy oz. $22 to $24
Platinum, dollars per troy oz. $77 to $80
Rhodium ..... $120.00 to $125.00
Silver ingots (c per troy oz.) 89.875
Thorium, per kg $42.00
Vanadium $2.45
Zirconium sponge $5.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot
No. 115 ..... 27.25
No. 120 ..... 26.25
No. 123 ..... 25.50
80-10-10 ingot
No. 295 ..... 31.25
No. 315 ..... 29.25
88-10-2 ingot
No. 210 ..... 28.25
No. 215 ..... 24.00
No. 245 ..... 30.75
Yellow ingot
No. 405 ..... 22.75
Manganese bronze
No. 421 ..... 24.50

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys
0.20 copper max 25.25-26.50
0.60 copper max 25.00-26.25
Piston alloys (No. 122 type) 24.25-25.00
No. 12 alum (No. 2 grade) 22.00-22.00
108 alloy 23.25-23.50
195 alloy 25.25-26.75
12 alloy (0.60 copper max.) 25.00-26.25
AXS-679 ..... 22.25-23.50

(Effective Dec. 16, 1957)

Steel deoxidizing aluminum, notch bar granulated or shot

Grade 1—95-97½% 23.00-24.00
Grade 2—92-95% 21.75-22.50
Grade 3—90-92% 20.50-21.50
Grade 4—85-90% 18.25-19.25

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	23	22¼
Yellow brass	17⅜	15⅜
Red brass	20¼	19½
Comm. bronze	21	20¼
Mang. bronze	16⅛	15⅜
Yellow brass rod ends	17⅛	

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 20¾
No. 2 copper wire 19¼
Light copper 17
*Refinery brass 18¾
Copper bearing material 18¼
*Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 20¾
No. 2 copper wire 19¼
Light copper 17
No. 1 composition 19¼
No. 1 comp. turnings 18¾
Hvy. yellow brass solids 13
Brass pipe 15½
Radiators 15¼

Aluminum

Mixed old cast ..... 13½—14
Mixed new clips ..... 16 —16½
Mixed turnings, dry ..... 14 —15

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Copper and Brass

No. 1 copper wire ..... 18½—18¾
No. 2 copper wire ..... 16¾—16¾
Light copper ..... 14¾—15¼
Auto radiators (unsweated) ..... 11¾—12
No. 1 composition ..... 15½—16
No. 1 composition turnings ..... 15 —15½
Cocks and faucets ..... 12 —12½
Clean heavy yellow brass ..... 11 —11½
Brass pipe ..... 12½—13
New soft brass clippings ..... 13 —13½
No. 1 brass rod turnings ..... 11¼—11¾

Aluminum

Alum. pistons and struts ..... 5½— 6
Aluminum crankcases ..... 10½—11
1100 (2S) aluminum clippings 14 —14½
Old sheet and utensils ..... 10½—11
Borings and turnings ..... 6½— 7
Industrial castings ..... 10½—11
2024 (24S) clippings ..... 12 —12½

Zinc

New zinc clippings ..... 4 — 4½
Old zinc ..... 3 — 3¼
Zinc routings ..... 1¾— 2
Old die cast scrap ..... 1½— 1¾

Nickel and Monel

Pure nickel clippings 42-45
Clean nickel turnings 37-40
Nickel anodes 42-45
Nickel rod ends 42-45
New Monel clippings 28-29
Clean Monel turnings 20-23
Old sheet Monel 25-26
Nickel silver clippings, mixed 18
Nickel silver turnings, mixed 15

Lead

Soft scrap lead ..... 8½— 9
Battery plates (dry) ..... 3½— 3¾
Batteries, acid free ..... 2¾— 3

Miscellaneous

Block tin ..... 75 —76
No. 1 pewter ..... 59 —60
Auto babbitt ..... 39 —40
Mixed common babbitt ..... 11 —11½
Solder joints ..... 14½—15
Siphon tops 42
Small foundry type ..... 12 —12¼
Monotype ..... 12 —12¼
Lino. and stereotype ..... 11 —11¼
Electrotype ..... 10 —10¼
Hand picked type shells ..... 7 — 7½
Lino. and stereo. dross ..... 3 — 3¼
Electro dross ..... 2½— 2¾

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PIL-ING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$114.00 *B3*		5.325 *B3*	7.80 *B3*	5.325 *B3*						
	Buffalo, N. Y.	$77.50 *R3, B3*	$96.00 *R3, B3*	$114.00 *R3, B3*	6.225 *B3*	5.325 *B3*	7.80 *B3*	5.325 *B3*	4.925 *R3, B3*	7.15 *S10*	7.325 *B3*			
	Phila., Pa.									7.70 *P15*				
	Harrison, N. J.													15.05 *C11*
	Conshohocken, Pa.		$101.00 *A2*	$121.00 *A2*					4.975 *A2*	7.20 *A2*	7.325 *A2*			
	New Bedford, Mass.									7.60 *R6*				
	Johnstown, Pa.	$77.50 *B3*	$96.00 *B3*	$114.00 *B3*		5.325 *B3*	7.80 *B3*							
	Boston, Mass.									7.70 *T8*				15.40 *T8*
	New Haven, Conn.									7.60 *D1*				
	Baltimore, Md.									7.15 *T8*				
	Phoenixville, Pa.					5.325 *P2*		5.325 *P2*						
	Sparrows Pt., Md.								4.925 *B3*		7.325 *B3*			
	Bridgeport, Wallingford, Conn.			$114.00 *N8*						7.60 *W1*				
	Pawtucket, R. I. Worcester, Mass.									7.70 *N7* 7.70 *A5*				15.40 *N7* 15.20 *T8*
MIDDLE WEST	Alton, Ill.								5.125 *L1*					
	Ashland, Ky.								4.925 *A7*					
	Canton-Massillon, Dover, Ohio		$96.00 *R3*	$114.00 *R3, T5*						7.15 *G4*		10.45 *G4*		14.85 *C11*
	Chicago, Ill. Franklin Park, Ill. Evanston, Ill.	$77.50 *U1, R3*	$96.00 *U1, R3,W8*	$114.00 *U1, R3,W8*	6.225 *U1*	5.275 *U1, W8 P13*	7.75 *U1, Y1 W8*	5.275 *U1*	4.925 *W8, N4, A1*	7.25 *A1, T8 M8*			8.10 *W8, S9, I3*	15.05 *A1, S9, G4*
	Cleveland, Ohio									7.15 *A5, J3*		10.45 *A5*	8.10 *J3*	
	Detroit, Mich.			$114.00 *R3*					5.025 *G3, M2*	7.25 *M2, D1, D2, G3, P11*	7.425 *G3*	10.60 *D2* 10.55 *G3*	8.10 *G3*	
	Anderson, Ind.									7.15 *G4*				
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana	$77.50 *U1*	$96.00 *U1*	$114.00 *U1, Y1*		5.275 *U1, I3*	7.75 *U1, I3*	5.275 *I3*	4.925 *U1, I3, Y1*	7.15 *Y1*	7.325 *U1, I3, Y1*	10.60 *Y1*	8.10 *U1, Y1*	
	Sterling, Ill.	$77.50 *N4*				5.275 *N4*			5.025 *N4*					
	Indianapolis, Ind.									7.30 *J3*				15.20 *J3*
	Newport, Ky.												8.10 *A9*	
	Middletown, Ohio													
	Niles, Warren, Ohio Sharon, Pa.		$96.00 *S1, C10*	$111.00 *C10, S1*					4.925 *R3, S1*	7.15 *R3, T4 S1*	7.325 *R3, S1*	10.50 *S1* 10.45 *R3*	8.10 *S1*	15.05 *S1*
	Pittsburgh, Pa. Midland, Pa. Butler, Pa. Aliquippa, Pa.	$77.50 *U1, P6*	$96.00 *U1, C11, P6*	$114.00 *U1, C11, B7*	6.225 *U1*	5.275 *U1, J3*	7.75 *U1, J3*	5.275 *U1*	4.925 *P6*	7.15 *J3, B4, S2*			8.10 *S9*	15.05 *S9*
	Weirton, Wheeling, Follansbee, W. Va.				6.225 *W3*	5.275 *W3*			4.925 *W3*	7.15 *W3, F3*	7.325 *W3*	10.50 *W3*		
	Youngstown, Ohio	$77.50 *R3*	$96.00 *Y1, C10*	$114.00 *Y1*			7.75 *Y1*			7.15 *Y1, J3*	7.325 *U1, Y1*	10.65 *Y1*	8.10 *U1, Y1*	15.05 *J3* 10.65 *Y1*
WEST	Fontana, Cal.	$88.00 *K1*	$105.50 *K1*	$135.00 *K1*		6.075 *K1*	8.55 *K1*	6.225 *K1*	5.825 *K1*	9.00 *K1*				
	Geneva, Utah		$96.00 *C7*			5.275 *C7*	7.75 *C7*							
	Kansas City, Mo.					5.375 *S2*	7.85 *S2*						8.35 *S2*	
	Los Angeles, Torrance, Cal.		$105.50 *B2*	$134.00 *B2*		5.975 *C7, B2*	8.45 *B2*		5.675 *C7, B2*	9.05 *J3*			9.30 *B2*	17.25 *J3*
	Minnequa, Colo.					5.575 *C6*			6.025 *C6*	9.10 *K1*				
	Portland, Ore.					6.025 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$105.50 *B2*			5.925 *B2*	8.40 *B2*		5.675 *C7, B2*					
	Seattle, Wash.		$109.50 *B2*			6.025 *B2*	8.50 *B2*		5.925 *B2*					
SOUTH	Atlanta, Ga.					5.475 *A8*			5.125 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$77.50 *T2*	$96.00 *T2*			5.275 *T2, R3, C16*	7.75 *T2*		4.925 *T2, R3, C16*		7.325 *T2*			
	Houston, Lone Star, Texas		$101.00 *S2*	$119.00 *S2*		5.375 *S2*	7.85 *S2*						8.35 *S2*	

(Effective Dec. 16, 1957)

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS								WIRE ROD	TINPLATE†		BLACK PLATE
		Hot rolled 18 ga. & hvyr.	Cold rolled	Galvanized	Enameling	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.		Cokes* 1.25 lb. base box	Electro* 0.25 lb. base box	Hollowware Enameling 29 ga.
EAST	Bethlehem, Pa.												
	Buffalo, N. Y.	4.925 *B3*	6.05 *B3*				7.275 *B3*	8.975 *B3*		6.15 *W6*			
	Claymont, Del.												
	Coatesville, Pa.												
	Conshohocken, Pa.	4.975 *A2*	6.10 *A2*				7.325 *A2*						
	Harrisburg, Pa.												
	Hartford, Conn.												
	Johnstown, Pa.									6.15 *B3*			
	Fairless, Pa.	4.975 *U1*	6.10 *U1*				7.325 *U1*	9.025 *U1*			$10.15 *U1*	$8.85 *U1*	
	New Haven, Conn.												
	Phoenixville, Pa.												
	Sparrows Pt., Md.	4.925 *B3*	6.05 *B3*	6.60 *B3*			7.275 *B3*	8.975 *B3*	9.725 *B3*	6.25 *B3*	$10.15 *B3*	$8.85 *B3*	
	Worcester, Mass.									6.45 *A5*			
	Trenton, N. J.												
MIDDLE WEST	Alton, Ill.									6.35 *L1*			
	Ashland, Ky.	4.925 *A7*		6.60 *A7*	6.625 *A7*								
	Canton-Massillon, Dover, Ohio			6.60 *R3, R1*									
	Chicago, Joliet, Ill.	4.925 *W8, A1*					7.275 *U1*			6.15 *A5, R3, W8, N4, K2*			
	Sterling, Ill.									6.25 *N4, K2*			
	Cleveland, Ohio	4.925 *R3, J3*	6.05 *R3, J3*		6.625 *R3*		7.275 *R3, J3*	8.975 *R3, J3*		6.15 *A5*			
	Detroit, Mich.	5.025 *G3, M2*	6.15 *G3* 6.05 *M2*				7.375 *G3*	9.075 *G3*					
	Newport, Ky.	4.925 *A1*	6.05 *A1*										
	Gary, Ind. Harbor, Indiana	4.925 *U1, I3, Y1*	6.05 *U1, I3, Y1*	6.60 *U1, I3*	6.625 *U1, I3, Y1*	7.00 *U1*	7.275 *U1, Y1, I3*	8.975 *U1, Y1*		6.15 *Y1*	$10.05 *U1, Y1*	$8.75 *I3, U1, Y1*	7.50 *U1, Y1*
	Granite City, Ill.	5.125 *G2*	6.25 *G2*	6.80 *G2*	6.825 *G2*							$8.85 *G2*	7.60 *G2*
	Kokomo, Ind.			6.70 *C9*						6.25 *C9*			
	Mansfield, Ohio		6.05 *E2*			7.00 *E2*							
	Middletown, Ohio		6.05 *A7*	6.60 *A7*	6.625 *A7*	7.00 *A7*							
	Niles, Warren, Ohio Sharon, Pa.	4.925 *R3, N3, S1*	6.05 *R3*	6.60 *R3*	6.625 *N3, S1*	7.00 *N3, S1, R3*	7.275 *R3*	8.975 *S1, R3*				$8.75 *R3*	
	Pittsburgh, Pa. Midland, Pa. Butler, Pa. Donora, Pa. Aliquippa, Pa.	4.925 *U1, J3, P6*	6.05 *U1, J3, P6*	6.60 *U1, J3*	6.625 *U1*		7.275 *U1, J3*	8.975 *U1, J3*	9.725 *U1*	6.15 *A5, J3, P6*	$10.05 *U1, J3*	$8.75 *U1, J3*	7.50 *U1, J3*
	Portsmouth, Ohio	4.925 *P7*	6.05 *P7*							6.15 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	4.925 *W3, H3*	6.05 *W3, F3, H3*	6.60 *W3, H3*		7.00 *W3, H3*	7.275 *W3*	8.975 *W3*			$10.05 *W3, H3*	$8.75 *W3, H3*	7.50 *W3*
	Youngstown, Ohio	4.925 *U1, Y1*	6.05 *Y1*		6.625 *Y1*		7.275 *Y1*	8.975 *Y1*		6.15 *Y1*			
WEST	Fontana, Cal.	5.825 *K1*	7.30 *K1*				8.175 *K1*	10.275 *K1*			$10.80 *K1*	$9.50 *K1*	
	Geneva, Utah	5.025 *C7*											
	Kansas City, Mo.									6.40 *S2*			
	Los Angeles, Torrance, Cal.									6.95 *B2*			
	Minnequa, Colo.									6.40 *C6*			
	San Francisco, Niles, Pittsburgh, Cal.	5.625 *C7*	7.00 *C7*	7.35 *C7*						6.95 *C7*	$10.80 *C7*	$9.50 *C7*	
	Seattle, Wash.												
SOUTH	Atlanta, Ga.												
	Fairfield, Ala. Alabama City, Ala.	4.925 *T2, R3*	6.05 *T2, R3*	6.60 *T2, R3*						6.15 *T2, R3*	$10.15 *T2*	$8.85 *T2*	
	Houston, Tex.									6.40 *S2*			

† Special coated mfg. terne deduct 50¢ from 1.25-lb. coke base box price. Can-making quality blackplate 55 to 128 lb. deduct $2.20 from 1.25 lb. coke base box.
* COKES: 1.50-lb. add 25¢.
ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb. 0.25 lb. add 65¢.

(Effective Dec. 16, 1957)

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon† Steel	Reinforcing	Cold Finished	Alloy Hot rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfrs. Bright
EAST	Bethlehem, Pa.				6.475 *B3*	8.775 *B3*	7.925 *B3*					
	Buffalo, N. Y.	5.425 *R3,B3*	5.425 *R3,B3*	7.35 *B3*	6.475 *B3,R3*	8.775 *B3,B5*	7.925 *B3*	5.10 *B3*		7.20 *B3*		7.65 *W6*
	Claymont, Del.							5.10 *C4*		7.20 *C4*	7.625 *C4*	
	Coatesville, Pa.							5.10 *L4*		7.20 *L4*	7.925 *L4*	
	Conshohocken, Pa.							5.20 *A2*	6.175 *A2*	7.20 *A2*	7.625 *A2*	
	Harrisburg, Pa.							5.80 *P2*	6.275 *P2*			
	Milton, Pa.	5.575 *M7*	5.575 *M7*									
	Hartford, Conn.			7.80 *R3*		9.075 *R3*	7.925 *B3*					
	Johnstown, Pa.	5.425 *B3*	5.425 *B3*		6.475 *B3*			5.10 *B3*		7.20 *B3*	7.625 *B3*	7.65 *B3*
	Fairless, Pa.	5.575 *U1*	5.575 *U1*		6.625 *U1*							
	Newark, N. J. Camden, N. J.			7.75 *W10* 7.75 *P10*		8.95 *W10* 8.95 *P10*						
	Bridgeport, Conn. Putnam, Conn. Willimantic, Conn.			7.85 *W10* 7.80 *J3*	6.55 *N8*	8.925 *N8*						
	Sparrows Pt., Md.		5.425 *B3*					5.10 *B3*		7.20 *B3*	7.625 *B3*	7.75 *B3*
	Palmer, Worcester, Readville, Mass. Mansfield, Mass.			7.85 *B3,C14*		9.075 *A5,B5*						7.95 *A5,* *W6*
	Spring City, Pa.			7.75 *K4*		8.95 *K4*						
MIDDLE WEST	Alton, Ill.	5.625 *L1*										7.85 *L1*
	Ashland,Newport,Ky.							5.10 *A2,A1*		7.20 *A1*		
	Canton, Massillon, Ohio			7.30 *R3,R2*	6.475 *R3,T5*	8.775 *R3,R2 T5*						
	Chicago, Joliet, Waukegan, Ill. Harvey, Ill.	5.425 *U1,R3, W8,N4,P13*	5.425 *U1,R3, N4,P13*	7.30 *A5, W10,W8 B5,L2,N9*	6.475 *U1,R3, W8*	8.775 *A5, W10,W8 L2,N8,B5*	7.925 *U1,W8*	5.10 *U1,A1, W8,I3*	6.175 *U1*	7.20 *U1,W8*	7.625 *U1,W8*	7.65 *A5,R3, W8,N4, K2,W7*
	Cleveland, Ohio	5.425 *R3*	5.425 *R3*	7.30 *A5,C13*		8.775 *A5, C13*	7.925 *R3*	5.20 *R3,J3*	6.175 *J3*		7.625 *R3, J3*	7.65 *A5, C13*
	Detroit, Mich.	5.525 *G3*	5.775 *G3*	7.30 *P3* 7.50 *P8,B5*	6.475 *R3* 6.575 *G3*	8.775 *R3* 8.975 *B5,P3, P8*	8.025 *G3*	5.20 *G3*		7.35 *G3*		
	Duluth, Minn.											7.65 *A3*
	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.425 *U1,I3, Y1*	5.425 *U1,I3, Y1*	7.30 *R3,I3*	6.475 *U1,I3, Y1*	8.775 *R3,M4*	7.925 *U1, Y1*	5.10 *U1,I3, Y1*	6.175 *I3,I5*	7.20 *U1,Y1*	7.625 *U1, Y1,I3*	7.75 *M4*
	Granite City, Ill.							5.30 *G2*				
	Kokomo, Ind											7.75 *C9*
	Sterling, Ill.	5.525 *N4*	5.525 *N4*					5.10 *N4*				7.75 *K2*
	Niles, Warren, Ohio Sharon, Pa.			7.30 *C10*	6.475 *C10,S1*	8.775 *C10*	7.925 *S1*	5.10 *R3,S1*		7.20 *S1*	7.625 *R3, S1*	
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.425 *U1,I3*	5.425 *U1,I3*	7.30 *A5,B4, R3,I3,C11, W10,S9,C8*	6.475 *U1,I3, C11,B7*	8.775 *A5, W10,R3,S9, C11,C8*	7.925 *U1,I3*	5.10 *U1,I3*	6.175 *U1*	7.20 *U1,I3, B7*	7.625 *U1,I3, B7*	7.65 *A5, I3,P6*
	Portsmouth, Ohio											7.65 *P7*
	Weirton, Wheeling, Follansbee, W. Va.							5.10 *W5*				
	Youngstown, Ohio	5.425 *U1,R3, Y1*	5.425 *U1,R3, Y1*	7.30 *A5,Y1, F3*	6.475 *U1,Y1*	8.775 *Y1,F2*	7.925 *U1,Y1*	5.10 *U1,R3, Y1*		7.20 *Y1*	7.625 *U1, R3,Y1*	7.65 *Y1*
WEST	Emeryville, Cal. Fontana, Cal.	6.175 *I3* 6.125 *K1*	6.175 *I3* 6.125 *K1*		7.525 *K1*		8.625 *K1*	5.90 *K1*		8.00 *K1*	8.425 *K1*	
	Geneva, Utah							5.10 *C7*			7.625 *C7*	
	Kansas City, Mo.	5.675 *S2*	5.675 *S2*		6.725 *S2*		8.175 *S2*					7.90 *S2*
	Los Angeles, Torrance, Cal.	6.125 *C7,B2*	6.125 *C7,B2*	8.75 *R3,P14*	7.525 *B2*	10.65 *P14*	8.625 *B2*					8.60 *B2*
	Minnequa, Colo.	5.875 *C6*	5.875 *C6*					5.95 *C6*				7.90 *C6*
	Portland, Ore.	6.175 *O2*	6.175 *O2*									
	San Francisco, Niles, Pittsburg, Cal	6.125 *C7* 6.175 *B2*	6.125 *C7* 6.175 *B2*				8.675 *B2*					8.60 *C7,C6*
	Seattle, Wash.	6.175 *B2,N6*	6.175 *B2*				8.675 *B2*	6.00 *B2*		8.10 *B2*	8.525 *B2*	
SOUTH	Atlanta, Ga.	5.625 *A8*	5.625 *A8*									7.85 *A8*
	Fairfield, Ala. City, Birmingham, Ala.	5.425 *T2,R3, C16*	5.425 *T2,R3, C16,S11*	7.90 *C16*			7.925 *T2*	5.10 *T2,R3*			7.625 *T2*	7.65 *T2,R3*
	Houston, Ft. Worth, Lone Star, Tex.	5.675 *S2*	5.675 *S2*		6.725 *S2*		8.175 *S2*	5.20 *S2* 5.45 *L3*		7.30 *S2*	7.725 *S2*	7.90 *S2*

(Effective Dec. 16, 1957)

† Merchant Quality. Special Quality 35c higher

STEEL PRICES

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme Newport Steel Co., Newport, Ky.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brook Plant, Wickwire Spencer Steel Div., Bordentown, Pa.
B7 A. M. Byers, Pittsburgh
B8 Bradburn Alloy Steel Corp., Braeburn, Pa.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C5 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C12 Cumberland Steel Co., Cumberland, Md.
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 C. O. Carbon, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C17 Chester Blast Furnace, Inc., Chester, Pa.

D1 Detroit Steel Corp., Detroit
D2 Dearborn Div., Sharon Steel Corp.
D3 Dover Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M6 Mystic Iron Works, Everett, Mass.
M7 Milton Steel Products Div., Milton, Pa.
M8 Mill Strip Products Co., Evanston, Ill.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N3 Niles Rolling Mill Div., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Carpenter Steel of New England, Inc., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.
P15 Philadelphia Steel and Wire Corp.

R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 J. & L. Steel Co., Stainless Div.
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Corp., Carnegie, Pa.
S10 Seneca Steel Service, Buffalo
S11 Southern Electric Steel Co., Birmingham

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.

Y1 Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING

Base discounts pct f.o.b. mills. Base price about $200 per net ton

	BUTTWELD														SEAMLESS							
	⅛ In.		¼ In.		1 In.		1¼ In.		1½ In.		2 In.		2½ - 3 In.		2 In.		2½ In.		3 In.		3½ - 4 In.	
STANDARD T & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B1*	3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.75	12.75	+1.75	13.25	+1.25	14.75	+1.50								
Youngstown *R3*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Fontana *K1*	+8.25	+23.5	+5.25	+19.5	+1.75	+15.00	0.75	+14.25	1.25	+13.25	1.75	+12.75	3.25	+13.00								
Pittsburgh *J3*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+21.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
Alton, Ill. *I1*	3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.75	12.75	+1.75	13.25	+1.25	14.75	+1.50								
Sharon *M3*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Fairless *N2*	3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.75	12.75	+1.75	13.25	+1.25	14.75	1.50								
Pittsburgh *N1*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+21.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
Wheeling *W5*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Wheatland *W4*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Youngstown *Y1*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+21.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
Indiana Harbor *Y1*	4.75	+11.0	7.75	+7.0	10.75	+2.50	13.25	+1.75	13.25	+0.75	14.25	+0.25	15.75	+1.00								
Lorain *N2*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B1*	7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50								
Youngstown *R3*	9.75	+4.0	13.75	list	16.75	+1.50	17.25	3.25	17.75	1.25	18.25	4.75	18.75	3.50								
Fairless *N2*	7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50								
Fontana *K1*	+3.75		8.25		3.25		3.75		4.25		4.75		5.25									
Pittsburgh *J3*	9.75	+4.0	13.75	list	16.75	+1.50	17.25	3.25	17.75	1.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50
Alton, Ill. *I1*	7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50								
Sharon *M3*	9.75	+4.0	13.75	list	16.75	+1.50	17.25	3.25	17.75	1.25	18.25	4.75	18.75	3.50								
Pittsburgh *N1*	9.75	+4.0	13.75	list	16.75	+1.50	17.25	3.25	17.75	1.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50
Wheeling *W5*	9.75	+4.0	13.75	list	16.75	+1.50	17.25	3.25	17.75	1.25	18.25	4.75	18.75	3.50								
Wheatland *W4*	9.75	+4.0	13.75	list	16.75	+1.50	17.25	3.25	17.75	1.25	18.25	4.75	18.75	3.50								
Youngstown *Y1*	9.75	+4.0	13.75	list	16.75	+1.50	17.25	3.25	17.75	1.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50
Indiana Harbor *Y1*	8.75	+5.0	12.75	+1.0	15.75	3.50	16.25	2.25	16.75	3.25	17.25	3.75	17.75	2.50								
Lorain *N2*	9.75	+4.0	13.75	list	16.75	+1.50	17.25	3.25	17.75	1.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50

Threads only, buttweld and seamless 2½ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5 pt. higher discount.
Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ⅛, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1 pt.; 2½ and 3-in., 1 pt. e.s. zinc price range of over 13¢ to 15¢ would lower discounts on 2 and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 10¢ per lb.

(Effective Dec. 16, 1957)

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	$1.795	T-1
18	4	1	—	5	2.50	T-4
18	4	2	—	—	1.96	T-2
1.5	4	1.5	8	—	1.155	M-1
6	4	2	6	—	1.545	M-3
6	4	2	5	—	1.30	M-2
High-carbon chromium					.925	D-3, D-5
Oil hardened manganese					.475	O-2
Special carbon					.36	W-1
Extra carbon					.36	W-1
Regular carbon					.305	W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

CLAD STEEL

Base prices, cents per lb f.o.b.

Stainless Type	Cladding	Plate (*A3, J2, L4, C4*) 10 pct	15 pct	20 pct	Sheet (*I2*) 20 pct
	302				37.50
	304	37.95	42.25	46.70	40.00
	316	44.40	49.50	54.50	58.75
	321	40.05	44.60	49.30	47.25
	347	42.40	47.55	52.80	57.00
	405	29.85	33.35	36.85	
	410	29.55	33.10	36.70	
	430	29.80	33.55	37.25	

CR Strip (89) Copper, 10 pct, 2 sides, 40.25; 1 side, 33.95.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Untreated
Bessemer *U1*	5.525	6.50	6.975				
Cleveland *R4*							14.75
So. Chicago *R4*				9.75			
Ensley *T2*	5.525	6.50					
Fairfield *T2*		6.50		9.75		6.60	
Gary *U1*	5.525					6.60	
Huntington *C6*		6.50					
Ind. Harbor *I3*	5.525		6.975	9.75		6.60	
Ind. Harbor *Y1*				9.75			
Johnstown *B3*		6.50					
Joliet *U1*			6.975				
Kansas City *S2*				9.75			14.75
Lackawanna *B3*	5.525	6.50	6.975			6.60	
Lebanon *B3*			6.975		14.50		14.75
Minnequa *C6*	5.525	7.00	6.975	9.75		6.60	14.75
Pittsburgh *P5*							14.75
Pittsburgh *J3*				9.75			
Seattle *B2*				10.25		6.75	15.75
Steelton *B3*	5.525		6.975			6.60	
Struthers *Y1*				9.75			
Torrance *C7*						6.75	
Williamsport *S5*		6.50					
Youngstown *R3*				9.75			

COKE

	Net-Ton
Furnace, beehive (f.o.b. Connellsville, Pa.)	$15.00 to $15.75
Foundry, beehive (f.o.b.)	$17.50 to $19.00
Foundry oven coke	
Buffalo, del'd	$31.75
Detroit, f.o.b.	30.50
New England, del'd	31.55
Kearney, N. J., f.o.b.	29.75
Philadelphia, f.o.b.	29.50
Swedeland, Pa., f.o.b.	29.50
Painesville, Ohio, f.o.b.	30.50
Erie, Pa., f.o.b.	30.50
Cleveland, del'd	32.65
Cincinnati, del'd	31.84
St. Paul, f.o.b.	29.75
St. Louis, f.o.b.	31.50
Birmingham, f.o.b.	28.85
Milwaukee, f.o.b.	30.50
Neville Is., Pa.	29.25

LAKE SUPERIOR ORES

51.50% Fe natural content, delivered lower Lake ports. Prices for 1957 season. Freight changes for seller's account.

	Gross Ton
Openhearth lump	$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Fully Processed
Field		9.625	
Armature	11.10	10.85	11.35
Elect.	11.80	11.55	12.05
Special Motor		12.10	
Motor	12.90	12.65	13.15
Dynamo	13.95	13.70	14.20
Trans. 72	15.00	14.75	15.25
Trans. 65	15.55		
		Grain Oriented	
Trans. 58	16.05	Trans. 66	20.20
Trans. 52	17.10	Trans. 80	19.20
		Trans. 73	19.70

Producing points: Beech Bottom (*W5*); Brackenridge (*A5*); Granite City (*G2*); Indiana Harbor (*I3*); Mansfield (*E2*); Newport, Ky. (*N5*); Niles, O. (*N6*); Vandergrift (*U1*); Warren, O. (*R6*); Zanesville, Butler (*A7*).

ELECTRODES

Cents per lb f.o.b. plant, threaded, with nipples, unbaxed.

GRAPHITE Diam. (In.)	Length (In.)	Price	CARBON* Diam. (In.)	Length (In.)	Price
24	84	26.00	40	100, 110	10.70
20	72	25.25	35	110	10.70
18	72	25.75	30	110	10.85
14	72	25.75	24	72 to 84	11.25
12	72	26.25	20	90	11.00
10	60	28.00	17	72	11.40
10	48	28.50	14	72	11.85
7	60	28.25	12	60	12.95
6	60	31.50	10	60	13.00
4	40	35.00	8	60	13.30
3	40	37.00			
2½	30	39.25			
2	24	60.75			

* Prices shown cover carbon nipples.

REFRACTORIES

Fire Clay Brick

Carloads per 1000

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5.00)	$135.00
No. 1 Ohio	120.00
Sec. Quality, Pa., Md., Ky., Mo., Ill.	120.00
No. 2 Ohio	102.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $2.00)	21.50

Silica Brick

Mt. Union, Pa., Ensley, Ala.	$150.00
Childs, Hays, Pa.	155.00
Chicago District	160.00
Western Utah	175.00
California	180.00
Super Duty Hays, Pa., Athens, Tex., Windham, Warren O., Morrisville	157.00-160.00
Silica cement, net ton, bulk, Latrobe	28.50
Silica cement, net ton, bulk, Chicago	25.50
Silica cement, net ton, bulk, Ensley, Ala.	26.50
Silica cement, net ton, bulk, Mt. Union	24.50
Silica cement, net ton, bulk, Utah and Calif.	37.00

Chrome Brick

Per net ton

Standard chemically bonded, Balt.	$105.00
Standard chemically bonded, Curtner, Calif.	115.00
Burned, Balt.	99.00

Magnesite Brick

Standard, Baltimore	$131.00
Chemically bonded, Baltimore	116.00

Grain Magnesite

St. ¾ to ½-in. grains

Domestic, f.o.b. Baltimore in bulk	$75.00
Domestic, f.o.b. Chewaiah, Wash., Luning, Nev.	
in bulk	46.00
in sacks	52.00-54.00

Dead Burned Dolomite

Per net ton

F.o.b. bulk, producing points in:	
Pa., W. Va., Ohio	$16.75
Midwest	17.00
Missouri Valley	15.00

(Effective Dec. 16, 1957)

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard Q Coated Nails Col	Woven Wire Fence Col	"T" Fence Posts Col	Single Loop Bale Ties Col	Galv. Barbed and Twisted Barbless Wire Col	Merch. Wire Ann'ld ¢ lb.	Merch. Wire Galv. ¢ lb.
Alabama City *R3*	173	187		212	193	8.65	9.20
Aliquippa *J3***	173	190			190	8.65	9.325
Atlanta *A8***	175	192		214	198	8.75	9.425
Bartonville *K2***	175	192	178	214	198	8.75	9.425**
Buffalo *W6*						8.65	8.95*
Chicago *N4***	173	190	172	212	196	8.65	9.325
Cleveland *A6*							
Cleveland *A9*						8.65	
Crawf'dav. *M4***	175	192		214	198	8.75	9.425
Donora, Pa. *A5*	173	187		212	193	8.65	9.20
Duluth *A9*	173	187		212	193	8.65	9.20
Fairfield, Ala. *T2*	173	187		212	193	8.65	9.20
Galveston *D4*	9.10‡						
Houston *S2*	178	192		217	198	8.90	9.45
Jacksonville *M4*	184 ‖	197		219	203	9.00	9.675
Johnstown *B3***	173	190	172		196**	8.65	9.325**
Joliet, Ill. *A5*	173	187		212	193	8.65	9.20
Kokomo *C9**	175	189		214	195*	8.75	9.30*
L. Angeles *R2****						9.60	10.275
Kansas City *S2**	178	192		217	198*	8.90	9.45*
Minnequa *C6‡*	178	192	177	217	198‡	8.90	9.45‡
Monessen *P6*					193	8.65	9.20
Palmer, Mass. *W6*						8.95	9.50*
Pittsburg, Cal. *C7*	192	210			213	9.60	10.15
Rankin, Pa. *A5*	173	187			193	8.65	9.20
So. Chicago *R3*	173	187			193	8.65	9.20
S. San Fran. *C6‡*				236		9.60	10.15‡
SparrowsPt. *B3***	175			214	198	8.75	9.425
Sterling, Ill. *N4****	175	192	172	214	198	8.75	9.425
Struthers, O. *Y1**						8.65	9.30
Worcester *A8*	179					8.95	9.50
Williamsport *S5*							

* Zinc less than .10¢.
** 11-12¢ zinc.
*** 10¢ zinc.
‡ Plus zinc extras.
‖ Wholesalers only.

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26 0.10	0.41 0.60	0.61 0.80	0.81 1.05	1.06 1.35
Baltimore, Md. *T8*	9.50	10.70	12.90	15.90	18.85
Bristol, Conn. *W12*		10.70	12.90	16.10	19.30
Boston *T8*	9.50	10.70	12.90	15.90	18.85
Buffalo, N. Y. *R7*	8.95	10.40	12.60	15.60	18.55
Carnegie, Pa. *S9*	8.95	10.40	12.60	15.60	18.55
Cleveland *A8*	8.95	10.40	12.60	15.60	18.55
Dearborn *S1*	9.05	10.50	12.70		
Detroit *D1*	9.05	10.50	12.70	15.70	
Detroit *D2*	9.05	10.50	12.70		
Dover, O. *G4*	8.95	10.40	12.60	15.60	18.55
Evanston, Ill. *M8*	9.05	10.40	12.60		
Franklin Park, Ill. *T8*	9.05	10.25	12.45	15.45	18.40
Harrison, N. J. *C11*			12.90	16.10	19.30
Indianapolis *J3*	9.10	10.55	12.60	15.60	18.55
Los Angeles *C1*	11.15	12.60	14.80	17.80	
New Castle, Pa. *B4*	8.95	10.40	12.60	15.60	
New Haven, Conn. *D1*	9.40	10.70	12.90	15.90	
Pawtucket, R. I. *N7*	9.50	10.70	12.90	15.90	18.85
Pittsburgh *S7*	8.95	10.40	12.60	15.60	18.55
Riverdale, Ill. *A1*	9.05	10.40	12.60	15.60	18.55
Sharon, Pa. *S1*	8.95	10.40	12.60	15.60	18.55
Trenton, *R4*		10.70	12.90	16.10	19.30
Wallingford *W1*	9.40	10.70	12.90	15.90	18.55
Warren, Ohio *T4*	8.95	10.40	12.60	15.60	18.75
Worcester, Mass. *A5*	9.50	10.70	12.90	15.90	18.85
Youngstown *J3*	8.95	10.40	12.60	15.60	18.55

BOILER TUBES

$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
Babcock & Wilcox	2	13	36.34	42.56	35.22
	2½	12	48.94	57.31	47.43
	3	12	56.51	66.18	54.77
	3½	11	65.97	77.25	63.93
	4	10	87.61	102.59	85.53
National Tube	2	13	36.34	42.56	35.22
	2½	12	48.94	57.31	47.43
	3	12	56.51	66.18	54.77
	3½	11	65.97	77.25	63.93
	4	10	87.61	102.59	85.53
Pittsburgh Steel	2	13	36.34	42.56	
	2½	12	48.94	57.31	
	3	12	56.51	66.18	
	3½	11	65.97	77.25	
	4	10	87.61	102.59	

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Machine and Carriage Bolts	Full Container Price	30 Cwt. Containers	20,000 Lb.	40,000 Lb.
		Pct. Discounts		
½" and smaller x 6" and shorter	49	54	56	57
⅝" thru 1" x longer than 6"	35	40	43	45
Bolts threaded 1 diam. inch & smaller x 6" and shorter	49	54	56	57
Lag, all diam. x 6" & shorter	49	54	56	57
Lag, all diam. longer than 6 in.	39	44½	47	48½
Plow bolts ½" and smaller x 6" and shorter	49	54	56	57

(Add 2% pct for broken case quantities)

Nuts, Hex, HP reg. & hvy.	Full case or Keg price
¾ in. or smaller	60½
⅞ in. to 1 in. inclusive	55½
1⅛ in. to 1½ in. inclusive	58½
1⅝ in. and larger	53½
C. P. Hex, reg. & hvy.	
¾ in. and smaller	60½
⅞ in. to 1½ in. inclusive	55½
1⅝ in. and larger	53½
Hot Galv. Hex Nuts (All Types)	
¾ in. and smaller	46½
Semi-finished Hex Nuts	
¾ in. or smaller	60½
⅞ in. to 1½ in. inclusive	55½
1⅝ in. and larger	53½
(Add 2% pct for broken case or keg quantities)	
Finished	
⅝ in. and smaller	63
Rivets	*Base per 100 lb*
½ in. and larger	$12.25
	Pct. Off List
⅜ in. and smaller	19

Cap Screws

Discount (Packages)

	Full Finished H. C. Heat Treat	
New std. hex head, packaged		
¼" diam. and smaller x 6" and shorter	40	26
⅜" and 7/16" diam. x 6" and shorter	22	3
¼" diam. and smaller x longer than 6"	8	+13
⅜" and 7/16" diam. x longer than 6"	6	+12
	C-1018 Steel Full-Finished Carbon Bulk	
¼" through ⅝" dia. x 6" and shorter	58	19
¾" through 1" dia. x 6" and shorter	45	22

Minimum quantity ¼" through ⅝" diam., 1,000 pieces; 7/16" through ⅝" diam., 2,000 pieces; ¾" through 1" diam., 500 pieces.

Machine Screws & Stove Bolts

	Quantity	Discount Mach. Screws	Discount Stove Bolts
Plain Finish			
Cartons		19	32
Bulk			
No. 2 to ¼" diam. inch	25,000-200,000	9	54
⅜ to ½" diam. inch	25,000-200,000	9	54
All diam. over 6" long	5,000-100,000	—	54

Machine Screws & Stove Bolt Nuts

	Quantity	Discount Hex	Discount Square
In Cartons		16	19
In Bulk			
¼" diam & smaller	15,000-100,000	7	9

CAST IRON WATER PIPE INDEX

Birmingham	125.8
New York	158.7
Chicago	140.9
San Francisco-L. A.	148.6

Dec. 1953, value, Class B or heavier 4 in. or larger, bell and spigot pipe. Explanation: p. 87, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.

ELECTROPLATING SUPPLIES

Anodes

(Costs per lb, frt allowed in quantity)

Copper	
Rolled elliptical, 18 in. or longer, 5000 lb lots	43.50
Electrodeposited	33.25
Brass, 80-20, ball anodes, 2000 lb or more	44.00
Zinc, ball anodes, 2000 lb lots	16.50
(For elliptical add 1¢ per lb)	
Nickel, 99 pct plus, rolled carbon, 5000 lb	1.0225
(Rolled depolarized add 3¢ per lb)	
Cadmium	1.70
Tin, ball anodes and elliptical $1.13 per lb.	

Chemicals

(Costs per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	74.70
Copper sulphate, 100 lb bags, per cwt.	24.35
Nickel salts, single, 100 lb bags	40.50
Nickel chloride, freight allowed, 500 lb	48.50
Sodium cyanide, domestic, f.o.b. N. Y., 200 lb drums	23.05
(Philadelphia price 23.10)	
Zinc cyanide, 100 lb	60.75
Potassium cyanide, 100 lb drum N. Y.	48.00
Chromic acid, flake type, 10,000 lb or more	31.00

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots for minus 100 mesh

Swedish sponge iron, del. East of Miss. River, ocean bags, 25,000 lb. and over	10.5¢
F.O.B. Riverton or Camden, New Jersey, freight allowed west of Miss. River	9.5¢
Domestic sponge iron, 98+% Fe, 25,000 lb. and over del'd East of Miss. River	10.5¢
F.O.B. Riverton, New Jersey, West of Miss. River	9.5¢
Canadian sponge iron, del'd in East, carloads	12.5¢
Electrolytic iron, annealed, imported 99.5+% Fe	27.5¢
domestic 99.5+% Fe	36.5¢
Electrolytic iron, unannealed minus 325 mesh, 99+% Fe	57.0¢
Electrolytic iron melting stock, 99.84% pure	27.0¢
Carbonyl iron size 3 to 20 micron, 98% 99.8+% Fe	88.0¢ to $2.85
Aluminum, freight allowed	38.00¢
Brass, 10 ton lots	31.1¢ to 47.1¢
Copper, electrolytic	41.50¢
Copper, reduced	40.3¢ to 48.8¢
Cadmium, 100-199 lb 95¢ plus metal value	
Chromium, electrolytic, 99.85% min. Fe, 03 max. Del'd	$5.00
Lead	21.50¢ lb, f.o.b. plant
Manganese f.o.b. Extron, Pa.	16.0¢
Molybdenum, 99%	$3.60 to $3.85
Nickel, chemically precipitated	$1.05
Nickel, unannealed	$1.00
Nickel, annealed	$1.06
Nickel, spherical, unannealed #80	$1.13
Silicon	43.50¢
Solder powder	13¢ plus met. value
Stainless steel, 302	$1.02
Stainless steel, 316	$1.30
Tin	14.00¢ plus metal value
Tungsten, 99% (65 mesh)	$3.75 (nominal)
Zinc, 5000 lb & over	17.5¢ to 39.7¢

WAREHOUSES

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery Charge	Sheets: Hot-Rolled 18 ga & hvr.	Sheets: Cold-Rolled 15 gage	Sheets: Galvanized 10 gage**	Strip: Hot-Rolled	Plates	Shapes: Standard Structural	Bars: Hot-Rolled merchant	Bars: Cold-Finished	Alloy Bars: Hot-Rolled 4615 As rolled	Alloy Bars: Hot-Rolled 4140 Annealed	Alloy Bars: Cold-Drawn 4615 As rolled	Alloy Bars: Cold-Drawn 4140 Annealed
Atlanta		8.59	9.87	10.13	8.64	8.97	9.05	9.01	10.68	.....	.....	.....	.....
Baltimore	$.10	8.38	8.98	9.71	8.86	8.76	9.29	9.16	11.44*	16.18	15.18	19.73	18.98
Birmingham	.15	8.18	9.45	10.15	8.23	8.56	8.64	8.60	10.57				.....
Boston	.10	9.48	10.54	11.55	9.52	9.82	9.73	9.83	13.00	15.79	15.38	19.89	19.18
Buffalo	.15	8.40	9.15	11.22	8.65	9.05	9.05	8.95	11.05*	16.34	15.15	19.01	18.95
Chicago	.15	8.35	9.60	10.15	8.38	8.71	8.79	8.75	8.95	15.80	14.80	19.35	18.60
Cincinnati	.15	8.49	9.65	10.20	8.69	9.08	9.33	9.07	9.46	15.61	15.11	18.96	18.91
Cleveland	.15	8.33	9.60	10.10	8.48	8.94	9.16	8.84	10.95*	15.89	14.89	19.44	18.96
Denver	.20	9.70	11.30	12.49	9.80	9.70	9.80	9.98	10.65				17.60
Detroit	.15	8.58	9.85	10.50	8.73	9.06	9.33	9.05	9.30	15.46	15.06	18.81	18.86
Houston		8.45	9.75		8.60	9.05	8.60	8.55	11.10	16.20		19.30	19.05
Kansas City	.20	9.02	10.27	10.07	9.05	9.38	9.46	9.42	9.87	20.02	15.47	20.02	19.27
Los Angeles	.10	7.85*	10.85	11.75	7.90	7.90	7.95	7.90	13.35*	17.05	16.10	21.05	20.35
Memphis	.15	8.02	9.22		8.12	8.35	8.39	8.25	9.85				.....
Milwaukee	.15	8.48	9.73	10.28	8.51	8.81	9.00	8.88	9.18	15.43	14.93	18.78	18.73
New York	.10	8.97	10.23	10.66	9.41	9.53	9.45	9.67	12.86*	15.02	15.19	18.42	18.99
Norfolk	.20	8.00			8.40	8.35	8.70	8.45	10.70				.....
Philadelphia	.10	8.10	9.00	9.97	8.79	8.87	8.60	8.75	11.61*	15.61	15.11	18.96	18.91
Pittsburgh	.15	8.33	9.60	10.50	8.48	8.71	8.79	8.75	10.95*	15.80	14.80	19.35	18.60
Portland		8.50	11.20	11.55	9.05	8.30	8.65	8.65	14.50	18.50	16.10	20.75	20.25
San Francisco	.10	9.45	10.85	11.10	9.55	9.70	9.60	9.80	13.10	17.05	16.10	21.05	20.35
Seattle		9.95	11.15	12.00	10.00	9.70	9.80	10.80	14.05	16.55	16.35	20.65	20.15
Spokane	.15	10.10	11.30	12.15	10.15	9.85	9.95	10.25	14.20		17.35	21.55	21.05
St. Louis	.15	8.69	9.94	10.51	8.74	9.08	9.25	9.12	9.56	15.66	15.16	19.01	18.96
St. Paul	.15	8.91	10.19	10.76	8.99	9.45	9.53	9.37	9.81		15.26		19.06

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. C12 sheets may be combined with each other for quantity. **All sizes except 18 and 16 gage. 10 gage sizes. † Deduct for country delivery. ‡ 3.15 in. to ½ in. * C1018—1 in. rounds.

(Effective Dec. 16, 1957)

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. *B6*	68.00	68.50	69.00	69.50	
Birmingham *R5*	62.00	62.50			
Birmingham *W9*	62.00	62.50	66.50		
Birmingham *U4*	62.00	62.50	66.50		
Buffalo *R5*	66.00	66.50	67.00	67.50	
Buffalo *H1*	66.00	66.50	67.00	67.50	
Buffalo *W6*	66.00	66.50	67.00	67.50	
Chester *P2*	66.50	67.00	67.50		
Chicago *I4*	66.00	66.50	66.50	67.00	
Cleveland *A5*	66.00	66.50	66.50	67.00	71.00†
Cleveland *R5*	66.00	66.50	66.50	67.00	
Duluth *I4*	66.00	66.50	66.50	67.00	71.00†
Erie *I4*	66.00	66.50	66.50	67.00	71.00†
Everett *M6*	67.50	68.00	68.50		
Fontana *K7*	75.00	75.50			
Geneva, Utah *C7*	66.00	66.50			
Granite City *G2*	67.90	68.40	68.90		
Hubbard *Y1*			66.50		
Ironton, Utah *C7*	66.00	66.50			
Midland *C11*	66.00				
Minnequa *C6*	68.00	68.50	69.00		
Monessen *P6*	66.00				
Neville Is. *P4*	66.00	66.50	66.50	67.00	71.00†
N. Tonawanda *F1*		66.50	67.00	67.50	
Sharpsville *S8*	66.00	66.50	66.50	67.00	
So. Chicago *R5*	66.00	66.50	66.50		
So. Chicago *U8*	66.00		66.50	67.00	
Swedeland *A2*	68.00	68.50	69.00	69.50	
Toledo *I4*	66.00	66.50	66.50	67.00	
Troy, N. Y. *R5*	68.00	68.50	69.00	69.50	74.00
Youngstown *Y1*			66.50	67.00	

DIFFERENTIALS: Add, 75c per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct); 50c per ton for each 0.25 pct manganese or portion thereof over 1 pct, $2 per ton for 0.50 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel.

Add $1.00 for 9.31-9.69 pct phos.

Silvery Iron: Buffalo, 6 pct, *H1* $79.25; Jackson *J1*, *I4* (Globe Div., $78.00, Niagara Falls (15.01-15.50), $101.00; Keokuk (14.01-14.50), $103.50; (15.51-16.00), $166.50. Add $1.00 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct, up to 18 pct. Add $1.25 for each 0.50 pct manganese over 1.00 pct. Bessemer silvery pig iron (under .10 pct phos.): $63.00. Add $1.00 premium for all grades silver, to 18 pct.

† Intermediate low phos.

STAINLESS STEEL

Base price cents per lb f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	22.00	23.75	23.25	25.25		27.00	39.75	32.25	37.00		16.75		17.00
Slabs, billets	27.00	27.00	28.00	31.50	32.00	33.25	49.50	40.00	46.50		21.50		21.75
Billets, forging		36.50	37.25	38.00	41.00	40.50	62.25	47.00	55.75	32.00	28.25	28.75	28.75
Bars, struct.	42.00	43.00	44.25	45.00	48.00	47.75	73.00	55.50	64.75	37.75	33.75	34.25	34.25
Plates	44.25	45.00	46.25	47.25	50.00	50.75	76.75	59.75	69.75	40.25	35.00	36.75	36.00
Sheets	48.50	49.25	51.25	52.00		55.50	81.50	65.50	79.25	48.25	40.25	—	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50		44.25	69.25	53.50	63.50		31.00	—	32.00
Strip, cold-rolled	45.00	49.25	47.50	52.00		55.50	81.50	65.50	79.25	48.25	40.25	—	40.75
Wire CF; Rod HR	40.00	40.75	42.00	42.75	45.50	45.25	69.75	52.50 52.75	61.50	35.75	32.00	32.50	32.50

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11*; Brackenridge, Pa., *A5*; Butler, Pa., *A7*; Vandergrift, Pa., *U1*; Washington, Pa., *W2*, *J2*, Baltimore, *E1*; Middletown, O., *A7*; Massillon, O., *R5*; Gary, *U1*; Bridgeville, Pa., *U2*; New Castle, Ind., *J2*.

Strip: Midland, Pa., *C11*; Waukegan, Cleveland, *A5*; Carnegie, Pa., *S9*; McKeesport, Pa., *F1*; Reading, Pa., *C2*, Washington, Pa., *W2*, W. Leechburg, Pa., *A5*; Bridgeville, Pa., *U2*; Detroit, *M2*; Canton-Massillon, O., *R5*; Harrison, N. J., *D1*; Youngstown, *J4*, Sharon, Pa., *S1*; Butler, Pa., *A7*; Wallingford, Conn., *U5* (plus further conversion extras); *W1*; New Bedford, Mass., (25c per lb higher), *R6*; Gary, *U1* (25c per lb higher).

Bar: Baltimore, *A7*, S. Duquesne, Pa., *U1*; Munhall, Pa., *U1*, Reading, Pa., *C2*, Titusville, Pa., *U2*, Washington, Pa., *J2*; McKeesport, Pa., *U1*, *F1*; Bridgeville, Pa., *U2*; Dunkirk, N. Y., *A5*; Massillon, O., *R5*, S. Chicago, *U1*; Syracuse, N. Y., *C11*; Watervliet, N. Y., *A5*; Waukegan, *A5*; Canton, O., *T5*, *R5*; Ft. Wayne, *I4*; Detroit, *R5*; Gary, *U1*.

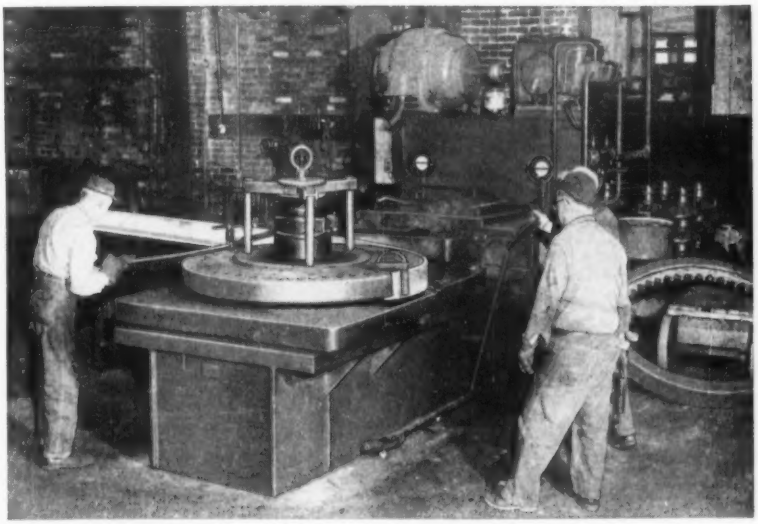
Wire: Waukegan, *A5*, Massillon, O., *R5*; McKeesport, Pa., *F1*; Ft. Wayne, *J4*, Harrison, N. J., *D1*; Baltimore, *A7*; Dunkirk, *A5*; Monessen, *P1*; Syracuse, *C11*; Bridgeville, *U2*.
Structurals: Baltimore, *A7*; Massillon, O., *R5*; Chicago, Ill., *J4*; Watervliet, N. Y., *A5*; Syracuse, *C11*; S. Chicago, *U1*.

Plates: Brackenridge, Pa., *A5*; Chicago, *U1*, Munhall, Pa., *U1*; Midland, Pa., *C11*; New Castle, Ind., *J2*; Middletown, *A7*; Washington, Pa., *J2*; Cleveland, Massillon, *R5*; Coatesville, Pa., *L3*; Vandergrift, Pa., *U1*; Gary, *U1*.

Forging billets: Midland, Pa., *C11*; Baltimore, *A7*; Washington, Pa., *J2*; McKeesport, *F1*; Massillon, Canton, O., *R5*; Watervliet, *A5*; Pittsburgh, Chicago, *U1*, Syracuse, *C11*; Detroit, *R5*; Munhall, Pa., S. Chicago, *U1*.

(Effective Dec. 16, 1957)

WILLIAMS-WHITE HYDRAULIC BULLDOZERS



The photograph illustrates a WILLIAMS-WHITE Hydraulic Bulldozer bending angle sections into complete circles as an initial step in the production of blade circle assemblies for use on road scrapers. The completed ring with gear inserted is shown at right in photo.

This is another example of the versatility of WILLIAMS-WHITE Hydraulic Bulldozers, available in capacities from 50 through 500 tons. For full information regarding these or other machines built to your specifications, write us or one of our representatives.

BUILDERS OF MACHINERY SINCE 1854

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MISSOURI, St. Louis or Kansas City: Robt. R. Stephens Mach'y Co.
OHIO, Cincinnati, Columbus or Dayton: Seifreat-Elstad Mach'y Co.
Cleveland: A. L. Bechtel & Son
OREGON, Portland: Allied Northwest Mach. Tool Corp.
PENNSYLVANIA, Pittsburgh: Frank Ryman's Sons
Wynnewood (Phila.): Edw. A. Lynch Mach'y Co.
WASHINGTON, Seattle: Perine Mach'y & Supply Co.
WISCONSIN, Milwaukee: Pagel Mach'y Co.

FERROALLOY PRICES

Ferrochrome

Cents per lb contained Cr, lump, bulk, carloads, del'd. 67-71% Cr, 50-1.00% max. Si.

0.02% C	41.00	0.50% C	38.00
0.05% C	39.00	1.00% C	37.75
0.10% C	38.50	1.50% C	37.50
0.20% C	38.25	2.00% C	37.25

4.00-4.50% C, 60-70% Cr, 1-2% Si.. 28.75
3.50-5.00% C, 57-64% Cr, 2.00-4.50% Si 27.50
0.025% C (Simplex) 36.75
8.00% max C, 50-55% Cr, 3-6% max Si 25.00
8.50% max C, 50-55% Cr, 3% max Si 25.00

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome max. 0.10% C price schedule. Add 5¢ for each additional 0.25% of N.

Chromium Metal

Per lb chromium, contained, packed, delivered, ton lots, 97% min Cr, 1% max. Fe

0.10% max. C $1.31
0.50% max. C 1.31
9 to 11% C, 88-91% Cr, 0.75% Fe.... 1.40

Electrolytic Chromium Metal

Per lb of metal 2" x D plate (⅛" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max.

Carloads $1.29
Ton lots 1.31
Less ton lots 1.33

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-45%, C 0.05% max.) Carloads, delivered, lump, 3-in. x down, packed.

Price is sum of contained Cr and contained Si.

	Cr	Si
Carloads	27.50	14.20
Ton lots	32.75	15.65
Less ton lots	34.35	17.30

Calcium-Silicon

Per lb of alloy, lump, delivered, packed. 30-33% Ca, 60-65% Si, 3.00 max. Fe.

Carloads 25.65
Ton lots 27.95
Less ton lots 29.45

Calcium-Manganese—Silicon

Cents per lb of alloy, lump, delivered, packed

16-20% Ca, 14-18% Mn, 53-59% Si

Carloads 24.25
Ton lots 26.15
Less ton lots 27.15

SMZ

Cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.

Ton lots 21.15
Less ton lots 22.40

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V 35-38-42% Cr, 17-19% Si, 8-11% Mn, packed.

Carload lots 17.20
Ton lots 18.70
Less ton lots 19.95

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed 18.50
Ton lots to carload packed 19.65
Less ton lots 20.90

Ferromanganese

Maximum base price, f.o.b., lump size, base content 74 to 76 pct Mn.

Producing Point	Cents per-lb
Marietta, Ashtabula, O., Alloy, W. Va., Sheffield, Ala., Portland, Ore.	12.25
Johnstown, Pa.	12.25
Sheridan, Pa.	12.25
Philo, Ohio	12.25
S. Duquesne	12.25

Add or substract 0.1¢ for each 1 pct Mn above or below base content.

Briquets, delivered, 66 pct Mn:

Carloads, bulk 14.80
Ton lots packed 17.20

Spiegeleisen

Per gross ton, lump, f.o.b. Palmerton, Pa.

Manganese	Silicon	
16 to 19%	3% max.	$100.50
19 to 21%	3% max.	102.50
21 to 23%	3% max.	105.00

Manganese Metal

2 in. x down, cents per pound of metal delivered.

95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed 45.75
Ton lots 47.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.

Carloads 34.00
Ton lots 36.00
250 to 1999 lb 38.00
Premium for Hydrogen - removed metal 0.75

Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max., carloads, lump, bulk, delivered, per lb of contained Mn 25.50

Low-Carb Ferromanganese

Cents per pound Mn contained, lump size, del'd Mn 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	37.15	39.95	41.15
0.07% max. C	35.10	37.90	39.10
0.10% max. C	34.35	37.15	38.35
0.15% max. C	33.60	36.40	37.60
0.30% max. C	32.10	34.90	36.10
0.50% max. C	31.60	34.40	35.60
0.75% max. C, 80-85% Mn, 5.0-7.0% Si	28.60	31.40	32.60

Silicomanganese

Lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point.

Carloads bulk 12.80
Ton lots, packed 14.45
Briquet contract basis carloads, bulk, delivered, per lb of briquet 15.10
Ton lots, packed, pallets 16.50

Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct., f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $106.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $93.00.

Silicon Metal

Cents per pound contained Si, lump size, delivered, packed.

	Ton lots, packed	Carloads, packed
96.75% Si, 1.25% Fe	24.20	22.90
98% Si, 0.75% Fe	24.95	23.65

Silicon Briquets

Cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si, briquets.

Carloads, bulk 7.70
Ton lots, packed 10.50

Electric Ferrosilicon

Cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.

50% Si	13.00	75% Si	16.40
65% Si	15.25	85% Si	18.10
	90% Si	19.50	

Ferrovanadium

50-55% V delivered, per pound, contained V, carloads, packed.

Openhearth 3.20
Crucible 3.30
High speed steel (Primos) 3.40

Calcium Metal

Eastern zone, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.20	4.55

(Effective Dec. 16, 1957)

Alsifer, 20% Al, 40% Si, 40% Fe, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads ..... 10.65¢
Ton lots ..... 11.80¢

Calcium molybdate, 43.6-46.6% f.o.b. Langeloth, Pa., per pound contained Mo $1.28

Ferrocolumbium, 50-50%, 2 in. x D, delivered per pound contained Cb.

Ton lots $4.90
Less ton lots 4.95

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, del'd ton lots, 2-in. x D per lb con't Sb plus Ta $4.25

Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth, Pa., per pound contained Mo.. $1.68

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $4.00 unitage, per gross ton $90.00
10 tons to less carload $110.00

Ferrotitanium, 40% regular grade 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.35

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.50
Less ton lots $1.54

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton $240.00

Ferrotungsten, ¼ x down packed, per pounds contained W, ton lots delivered ..... $2.60 (nominal)

Molybdic oxide, briquets per lb contained Mo, f.o.b. Langeloth, Pa. $1.41
bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.38

Simanal, 20% Si, 20% Mn, 20% Al, f.o.b. Philo, Ohio, freight allowed per lb.

Carload, bulk lump ..... 18.50¢
Ton lots, packed lump ..... 20.50¢
Less ton lots ..... 21.00¢

Vanadium oxide, 86-89% V_2O_5 per pound contained V_2O_5 .. $1.38

Zirconium, per lb of alloy

35-40% f.o.b. freight allowed, carloads, packed ..... 27.25¢
12-15%, del'd lump, bulk-carloads ..... 9.25¢

Boron Agents

Borosil, per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B

2000 lb carload $5.50

Bortram, f.o.b. Niagara Falls.

Ton lots per pound ..... 45¢
Less ton lots, per pound ..... 50¢

Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4-5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.

Ton lots per pound ..... 14.00¢

Ferroboron, 17.50 min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots, F.o.b. Wash., Pa., Niagara Falls, N. Y., delivered 100 lb up $1.20

10 to 14% B ..... .85
14 to 19% 1.20
19% min. B 1.50

Grainal, f.o.b. Bridgeville, Pa., freight, allowed, 100 lb and over

No. 1 ..... $1.05
No. 79 ..... 50¢

Manganese-Boron, 75.00% Mn, 15.20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.

Ton lots $1.46
Less ton lots 1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots 2.15

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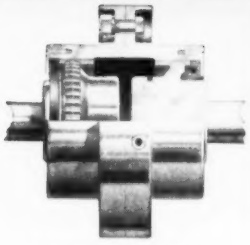

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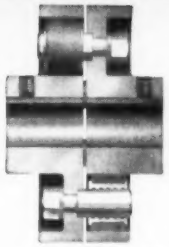

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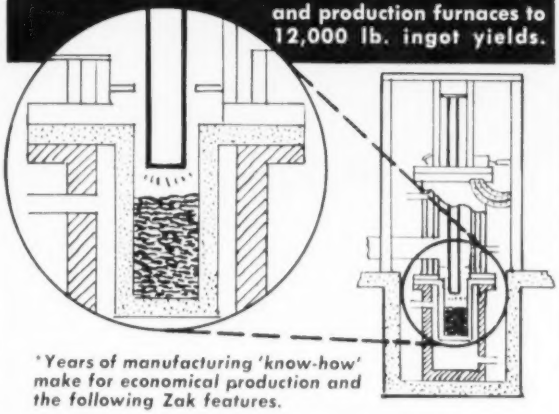

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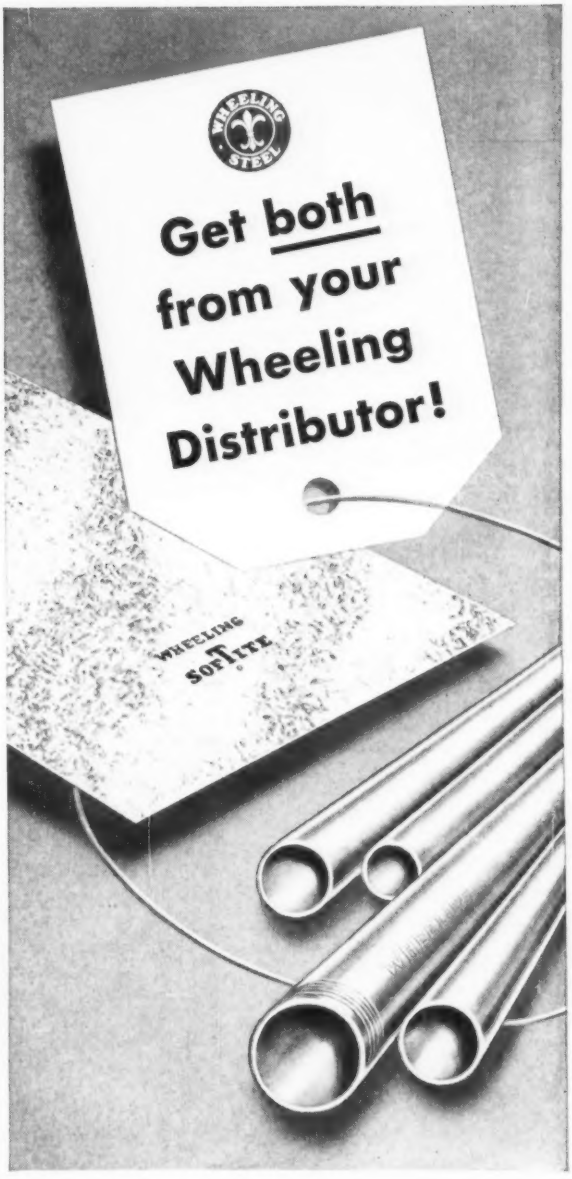

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THE CLEARING HOUSE

Chicago Buyers Want Sheet Fabricators

Used machinery dealers there who have specialized in them are doing well.

Toolroom equipment is also moving strongly but production items are spotty.

▪ Opinions on what's happening in the used machine tool business in Chicago range all over the map. For some dealers, it's up. For some, it's terrible. And some are holding even. A careful appraisal of all of these comments suggests this is what's happening:

(1) Customers are cutting back their buying, all right, but concentrating it with firms they've done the majority of their business with in the past. As a result, the seller of sheet metal fabricating equipment who's specialized in that line and cultivated that type of customer finds that he's doing a pretty good level of business in that line.

Production Tools Slow—On the other hand, if he began carrying some high production tools, or even heavy stocks of general toolroom equipment during the high business levels of the past two years, he finds that he's not getting much call for that type of equipment.

(2) Not only is material easier to get for stocking inventories of used tools, but the prices are lower and getting a little more so. Some dealers will argue violently that this is not the case, but it is happening. And if some dealers aren't yet ready to agree, they are going to get consumer pressure in the next two months to make price concessions.

Rebuilding Inactive—(3) Overall, business is not falling off heavily in the Midwest. Detroit buying has been a disappointment, but sheet metal fabricating equipment and general toolroom equipment have held well in the Chicago and Mississippi Valley areas. High-production, heavier equipment is spotty. It's a little easier to get, but sales in this line haven't held up as well as they have in lighter equipment lines. This has also affected rebuilding activity. Rebuilder backlogs are down, some at about 30 days or even lower.

There are some big rebuild orders brewing, but impending orders don't put any coal in the stove, and, until they break, rebuild business levels have slumped generally more than have sales of reconditioned and "as is" used tools.

A Warm Spring?—Most dealers are forecasting that December sales, overall, will be below the November level, but no more than could be normally expected of the year-end seasonal dropoff. One thing that has raised some hopes for spring of 1958—there are a considerable number of inquiries. Like the pending orders for machine tool rebuilding, these don't pull the books out of the red, but they do indicate there is some unsatisfied consumer demand waiting somewhere offstage. The question now: Will the general business climate warm up enough to coax this demand into the open?

Foreign tools seem to be hit with the same dollar-consciousness that has slowed new tool sales. Customers are holding off, waiting to see what 1958 will bring. Meantime they are buying more used equipment, mostly lighter tools.

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5 ton Cleveland	60' Span 115 Volt D.C.
5 ton Shepard Niles	70' Span 230 Volt D.C.
8 ton P&H	55' Span 220/3/60
10 ton Shepard Niles	38' Span 440/3/60
10 ton Shaw	48' Span 230 Volt D.C.
10 ton Shaw	120' Span 230 Volt D.C.
15 ton Shepard Niles	52' Span 230 Volt D.C.
15 ton Niles	75' Span 230/3/60
20 ton Shaw	28' Span 230 Volt D.C.
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250 ton Bliss #S85-8" Str. Bed 28" x 30"

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1	725	Whse.	300	600	2300/4000
1	500	Cr. Wh.	720	600	2300/440
1	500	G.E.	900	250	2300
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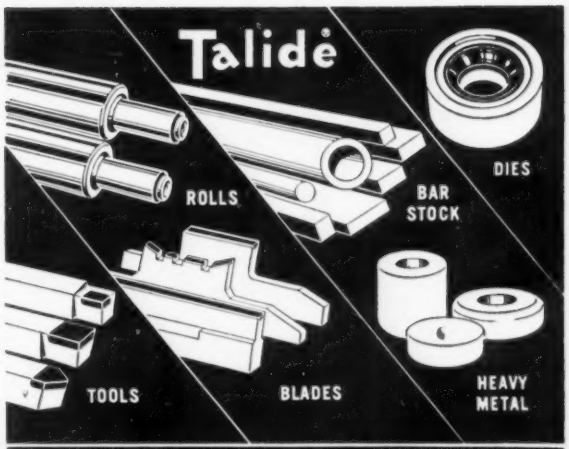

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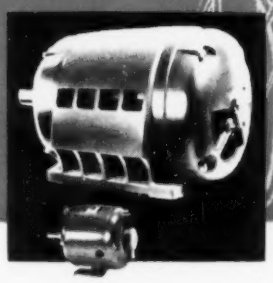

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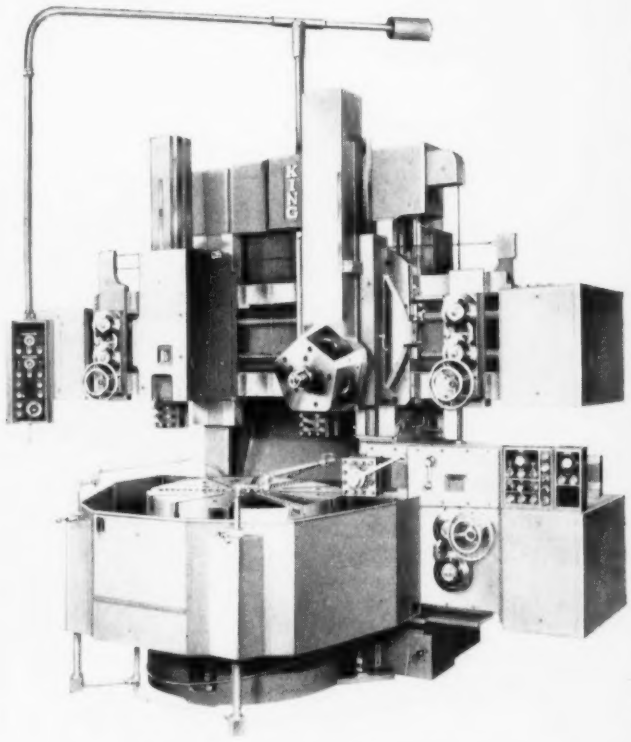

Machine illustrated is a 46" size with Ram Head and Turret Head on Rail, Side Head, and Complete–Unit Coolant Pan. Electrically Controlled King Machines are available in sizes 30", 36", 46", 56" and up, in a wide variety of head combinations, with or without side head.

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